

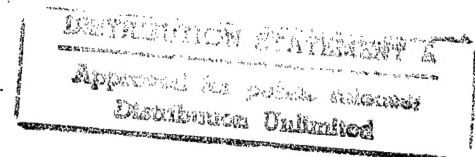
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JPRS-UCR-84-001

9 January 1984

# USSR Report

CONSTRUCTION AND RELATED INDUSTRIES



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9 January 1984

## USSR REPORT

### CONSTRUCTION AND RELATED INDUSTRIES

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## CONSTRUCTION PLANNING AND ECONOMICS

### GOSPLAN, STROYBANK OFFICIALS RESPOND TO COMMENTARY ON CONSTRUCTION PROBLEMS

Moscow STROITEL'NAYA GAZETA in Russian 9 Oct 83 p 2

/Article from Department of Economics and Labor Organization of STROITEL'NAYA GAZETA: "First of All -- Discipline"/

/Text/ On 16 January of this year, in an article by the chief of the Planning Department for a combine of Voroshilovgradtyazhstroy A. Zibrov, entitled "If Only It Is Included in the Title," STROITEL'NAYA GAZETA commenced a discussion on increasing the responsibility of all those participating in construction work with regard to accelerating the placing in operation of production capabilities and installations and the fulfillment of contractual obligations.

During the period devoted to this discussion, 16 articles were published by specialists and the Editorial Board received dozens of letters from readers. In response to a request by the newspaper, executives of USSR Gosplan and USSR Stroybank herein provide their comments to the opinions and recommendations expressed.

Bitter Truth of a Contractor -- by V. Balakin, deputy chief of the Department of Construction and the Construction Industry of USSR Gosplan.

The subject of the discussion is a very vital one. Statistics indicate that 20-30 percent of all installations not placed in operation were not introduced because of problems with the clients. This includes delays in providing technical documentation for the construction projects, incidents of poor quality use of such documentation, changes in plans during the course of construction, incorrect determination of the cost of complexes under construction, untimely and incomplete deliveries of technological equipment, late preparation of contracts and financing for construction projects and disruption of schedules for the halting of existing production efforts for modernization purposes.

The discussion materials contained a large number of specific examples of the consequences of non-fulfillment by the clients of their many functions. It is

obvious that in turn these factors are also greatly dependent upon the planners, producers and suppliers of the equipment. However, legally the construction is carried out on the basis of a contract between two sides: a client and a contractor, who must themselves regulate relationships with other participants in the construction. Thus the discussion mainly took the form of claims being addressed against the clients by the contractors and recommendations for increasing the responsibility of the clients for the final results of the construction process.

Opinion of Readers. "Many present day shortcomings in construction are caused for the most part by violations of existing directive and normative documents and by the absence of proper state discipline among those participating in the construction production line and especially among the clients" (majority of those participating in the discussion).

This is truly so. For example, the decree of the CPSU Central Committee and the USSR Council of Ministers on improving the economic mechanism clearly states that a plan for capital construction must include construction projects for which technical documentation was made available on 1 July of the year preceding the planned year. Why then should problems arise regarding the untimely availability of planning-estimates documentation for construction projects?

The rules for capital construction contracts stipulate that the contracts must be concluded within a 2 month period following approval of the plan and yet the campaign for concluding them drags out for almost 6 months. This same document calls for definite sanctions to be handed down for violations by the sides involved of the contractual obligations. However, more often than not these sanctions are not applied to the guilty parties.

The mentioned decree of the CPSU Central Committee and the USSR Council of Ministers has established the order for approving the plan for commodity construction output for the enterprises and client-organizations.

Recommendation of the Readers. "A correction should be introduced to the established tradition of having the contractors bear all responsibility and guilt for the unsatisfactory status of affairs in construction -- the role and responsibility of the clients in the construction process should be raised considerably." (majority of those participating in the discussion).

Such a formulation for this problem is proper and not accidental. In view of the fact that construction is not a goal in itself but rather a means for developing the economy and solving social problems, the clients are thus confronted with the task of making efficient use of capital investments in the interest of ensuring the planned development of the branches and the elimination of disproportions within them.

First of all, the elimination of a dispersion of resources among numerous construction projects and concentrating them on the completion of projects already under construction, in the interest of reducing the volumes of unfinished construction, is dependent upon the clients. Such a concentration must be ensured in the draft plans.

A client, as the party who is most interested in the rapid placing in operation of production capabilities and installations, is obligated to observe in a very strict manner, during the construction process, the contractual obligations and functions imposed upon him. He must bear full responsibility for the fulfillment, within the established periods, of the tasks for placing capabilities and fixed capital in operation, the plans for commodity construction output and also for the rapid mastering of capabilities newly placed in operation. Towards this end, he must select correctly and prepare the sites for construction and ensure that the construction projects are provided with high quality plans in a timely manner, while devoting special attention to accurately defining the start-up complexes and their cost and equipment deliveries according to schedules, depending upon the departmental subordination of the completion organization, the timely carrying out of start-up and adjustment work and the training of operating personnel.

The solving of these problems does not require any change in the established system for issuing new normative documents.

In addition, a number of questions were raised in the discussion materials, the solutions for which require a change in the existing system.

Recommendation of Readers. "Change the sequence for developing the plan. Initially conclude the contracts and subsequently include projects in the plan. The inclusion of projects in the plan must serve as approval of the contract and as authorization to implement it." (V. Novikov, "First the Contract," STROITEL'NAYA GAZETA, No. 24, 25 February).

To agree with such a recommendation is tantamount to rejecting centralized planned management and to violating the principle of proportional development of the national economy. Certainly, the plan must be the primary consideration and the contract -- the secondary one. The latter must regulate the interrelationships of the sides and not the purpose of the construction.

The elimination of the existing shortcomings in the contractual campaigns must be carried out using another method: the annual drawing up of contracts, with one general contract being concluded for the entire construction period, must be rejected. Such a recommendation is examined in the central organs and at the same time the plans call for changes to be introduced into the system for and the amounts of sanctions for the non-fulfillment of contractual obligations. In discussing sanctions, it should be noted that the general contractors are making poor use of Point 68 of the Rules for Contracts, with regard to reimbursement for all losses (including percentages for the untimely turning over of projects).

Recommendation of Readers. "To redistribute a portion of the profits of sub-contracting organizations and transport in favor of a general contractor" (A. Adamiya, "Degree of Participation," STROITEL'NAYA GAZETA, No. 17, 9 February).

It is difficult to support this recommendation, since it is in conflict with the basic principles of cost accounting. The difference in profitability levels is taken into account in the plans for the production costs for work and

profit. It must be assumed that the introduction of new estimated norms and prices on 1 January 1984 will smooth out this difference to a considerable degree.

In this same article, A. Adamiya writes that the evaluative indicator for commodity construction output is in conflict with the need for fulfilling the inventory plan. It is completely obvious that orientation of the planned indicators on the final work results determines the priority of these indicators. Under conditions in which the plan is fulfilled, this does not cause any harm to the inventory. In the case of non-fulfillment of the plan, the resources must be employed mainly for projects which are under construction.

Opinion of Readers. "The institutes of USSR Stroybank must ensure the continuous issuing of credit for unfinished construction-installation work under all conditions. The cessation of this type of credit for any reason is equivalent to the cessation of construction" (majority of those who participated in the discussion).

It is our firm conviction that in order to ensure the continuous issuing of credit by the bank, use must be made of all resources called for in the credit plan for these purposes, with no limitation being imposed with regard to using only resources accumulated by the particular client. Beyond any doubt, we can agree with the authors that this represents an incorrect classification by the banks of projects included in the plan, projects for which the client has still not opened up financing of a "non-plan" nature.

Recommendation of the readers. "To issue credit for unfinished construction-installation work not to the contractor but rather to the client" (A. Volosatov, "Desired and Actual," STROITEL'NAYA GAZETA, No. 33, 18 March).

This recommendation is in conflict with the basic principle of crediting -- the issuing of credit for logistical support and also the concept of computations for commodity construction output.

The operational results of the construction ministries during the first 6 months of this year underscore a trend towards improving the work of construction organizations. An increase in the degree of responsibility being displayed by all those participating in construction will make it possible to improve the status of affairs in this most important branch of the national economy.

Through a Prism of Control -- by V. Kulikov, member of the Administration of USSR Stroybank and chief of the Administration for the Financing and Crediting of Contractual Organizations.

Recommendation of Readers. "To establish a schedule for concluding contractual agreements for capital construction prior to 1 January of the planned year. To increase the period for regulating differences in contractual agreements to 20 days" (A. Ivanov, "Do Not Argue, But Build," STROITEL'NAYA GAZETA, No. 19, 13 February).

In accordance with the draft new rules for contractual agreements for capital construction, the drawing up of contractual agreements must be carried out within a 2 month period following approval of the title list, but no later than 1 January of the planned year, based upon the fact that the title lists must be approved prior to 1 November of the year preceding the planned year.

Experience reveals that the contractual campaign is annually held up for an extended period of time. Even by 1 April, contractual agreements have not been drawn up at many construction sites. Under these conditions, it is hardly advisable to double the existing period for regulating differences between the client and contractor. This could lead to further delays in drawing up the contracts.

Recommendation of Readers. "Raise the effectiveness of property influence on the carrying out of contractual obligations." (majority of those participating in the discussion).

The need for raising contractual discipline and strengthening the role played by economic sanctions for violations of economic contracts in construction is beyond dispute. The above-mentioned draft rules for contracts call for a considerable increase in property responsibility by the parties involved for violations of contractual obligations.

Recommendation of Readers. "Introduce into the practice of USSR Stroybank institutes a preliminary check on the title lists prior to their being turned over to the contractor for the purpose of drawing up contracts." (S. Dichenkov, "Weighty Utterance By the Bank," STROITEL'NAYA GAZETA, No. 30, 11 March).

Such work is presently being carried out in all areas by the institutes of USSR Stroybank. In conformity with the USSR Stroybank Regulations, the bank's institutes participate in the work of preparing the draft plans for capital construction and the title lists for the construction projects and installations. Towards this end, the bank's institutes receive the draft plans for capital construction and the title lists for the construction projects and installations from the enterprises and organizations, they examine them prior to presentation for approval by higher authority and they introduce their own recommendations for the draft plan.

When examining the draft title lists, the bank's institutes ensure the adoption by the clients of those recommendations aimed primarily at ensuring the availability of capital investments for construction projects and installations under construction, in the amounts required for their completion within the established periods. A great amount of attention is being given to checking upon the availability of properly approved and complete planning-estimates documentation for the construction projects included in the draft plan. Projects for which such documentation is not available are excluded from the plan by the bank.

Recommendation of Readers.. "USSR Stroybank should reexamine certain instructions, the observance of which leads to violations of the principle of continuity in the issuing of credit to a contractor." (A. Dominas, "Percentage of the Percentage of Difference," STROITEL'NAYA GAZETA, No. 76, 26 June; P. Chekan, "Ban Against Maneuvering," STROITEL'NAYA GAZETA, No. 83, 13 July).



It is apparent from articles already published that here we have in mind instances of insufficient resources for the issuing of credit to contractual organizations to cover expenditures for unfinished production, with incomplete accumulation of the resources of clients, made available in connection with the abolishment of intermediate payments for work carried out and also concerning the exclusion from credited expenditures of unfinished production on projects not accepted by the bank for financing.

The instructions handed down by USSR Stroybank call for the issuing of credit for unfinished production expenditures for each contractual organization regardless of the total amount of resources accumulated by the client for a given construction project and for their regulation to be carried out within the limits for resources collected for a city, oblast or republic on the whole and, when necessary, using the reserve of USSR Stroybank.

In the interest of raising the responsibility of the clients for the timely and complete enumeration of the internal resources for financing capital construction, Instruction No. 7/54 of USSR Stroybank and USSR Gosbank dated 7 March 1980 established the fact that the bank's institutes submit recommendations to the appropriate economic organs on reducing capital investments for those clients which were not provided with a payment for internal resources, for the total amount of the underpayment.

The authors of some articles have recommended that the contractual organizations be issued credit regardless of the opening of financing for construction projects or the results of economic-financial activities, that is, automatically.

The introduction of such a system would signify the use of credit for covering the expenditures for projects, the construction of which involves violations of state planning and planning-estimates discipline. These recommendations testify to the consumer attitude of a number of construction organizations with regard to obtaining resources from the state.

It is known that a loss in internal working capital and shortages in such capital as a rule are the result of unprofitable work by many contractual organizations. However, instead of furnishing them with true assistance in improving their economic activity and financial status, the construction ministries and their territorial organs of administration often manifest a desire to cover the financial problems by means of bank credit.

Recommendation of Readers. "To expand the network of construction-installation organizations of branch client-ministries for carrying out work concerned with the modernization and technical reequipping of enterprises." (N. Sokolov, "On One's Own Saucer," STROITEL'NAYA GAZETA, No. 53, 4 May).

As is known, the task has been assigned in capital construction of making capital investments and logistical and labor resources available primarily for the reequipping and modernization of existing enterprises, reducing the number of newly begun construction projects and also the volume of unfinished construction.

The recommendation by N. Sokolov warrants attention. The measures proposed by him are contained in a plan for new documents aimed at improving the structure of construction administration.

Recommendation of Readers. "To disseminate on a more extensive scale the experience accumulated in creating services for a single client."  
(N. Patrushev, "To Unite Clients," STROITEL'NAYA GAZETA, No. 80, 6 July).

The USSR Council of Ministers, in its 5 October 1981 decree entitled "Measures for Raising the Effectiveness of Capital Investments Allocated for Housing Construction" recommended that the councils of ministers of union and autonomous republics, USSR ministries and departments and the executive committees of councils of people's deputies complete the creation in 1982, in the capitals of union and autonomous republics, the administrative centers of krays and oblasts and also in cities having populations in excess of 100,000, services for a single client for the construction of housing and cultural-domestic and municipal economy installations using the contractual method.

The Editorial Board notes with satisfaction that the majority of the opinions and recommendations expressed by readers of STROITEL'NAYA GAZETA have received the unanimous support of the representatives of USSR Gosplan and USSR Stroybank. This applies first of all to the need for a sharp increase in the responsibility of a client for the investment process and also all participants in the construction production line for the carrying out of contractual obligations and for intensifying the effect of legal norms in the relationships of allied workers.

As borne out by the statements of specialists, a number of the specific measures recommended conform to the innovations called for in the draft new rules for contractual agreements for capital construction. The rules for financing and the issuing of credit in construction, statutes on organizational relationships -- general contractors with sub-contracting organizations and other newly prepared documents of economic legislation.

At the same time, not all of the recommendations were beyond dispute. In particular, USSR Stroybank does not consider it advisable to abolish certain limitations associated with the issuing of credit for unfinished construction production. USSR Gosplan objects to the recommendations associated with the formation of plans and the drawing up of contracts. Nevertheless, the exchange of opinions on the pages of the newspaper defines more clearly the essence of certain problems concerned with improving the economic mechanism and this will make it possible in the future to find optimum methods for solving them.

On the whole, the discussion revealed that an improvement in the efficiency of construction production, based upon a strengthening of state, planning, financial, planning-estimates and contractual discipline constitutes a powerful reserve for bringing about strong improvements in the status of affairs in capital construction.

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## CONSTRUCTION PLANNING AND ECONOMICS

### GOSSTROY CONSTRUCTION PLANNING EXPERIMENT SUPPORTED

Moscow IZVESTIYA in Russian 12 Oct 83 p 2

[Article by IZVESTIYA correspondent E. Kondratov: "The Experiment Has Been Successful. What Is Next?"]

[Text] "We are taking part in a Gosstroy experiment..." state the staff members of the Bureau of Expert Review and Improvement of Planning Decisions. This organization has been working in the city on the Volga for 5 years now. It was established here following the example in Leningrad, where a similar bureau was created 3 years previously. There are only six of them in all in the country at this time. Time will tell if there will be more--the experiment is still continuing. Its objective is quite specific: to reinforce the influence of construction organizations on improvement of planning decisions.

The bureau was not created from a good life, as they say. According to USSR Gosstroy data, one-third of the plans which emanate from the many "gipros" [state planning institutes] need serious modification, and even complete reworking. Gross errors and miscalculations, the unjustified high prices of projects being built, the preference for obsolete, stereotyped solutions to innovations in technical thinking--what sins aren't the planners being charged with these days! And even if it is one's business to reproach, this criticism, let us say frankly, is ineffective. The objective conditions which prevent the planning organizations from working better cannot be left out of one's reckoning. One of them is the scarcity of highly skilled personnel. In recent years construction has not been providing institutes with specialists who know their business. And most of those sitting at the drafting boards are either recent VUZ graduates or long-time institute residents who long ago lost touch with practical problems. And when planners concern themselves very little with a comparison of possible alternatives, competitive planning and discussions in institutes on the subject of "how better" are a great rarity. And if we add to this the fact that customers of the plans monitor their quality thoroughly badly, and that the builders have no objection as a rule to carrying out construction a little more expensively, obtaining a few more resources and the maximum stock of materials, is the high percentage of defective planning surprising?

And one is surprised all the same... They showed me, as an example, the plan for construction of a new section of a tarpaper and roofing material plant. The concept was simply marvelous on the blueprints: they build the plant without stopping production. But it turned out in fact that this was physically impossible. Or another example: the plan--for renovation of a glass plant in Syzran'--called for expenditures of about 3 million rubles, but it turned out that 2 million also would be enough. The planners intended to erect several structures--a main building, a block of auxiliary shops and additional accommodations. It turned out that all this can be accommodated under one roof, and at the same time the building would not be larger, but on the contrary, it would be shortened by 18 meters.

However, I'll be accurate, too: all this was not "revealed" and did not "turn out" by itself, of course. The Bureau of Expert Review and Improvement of Planning Decisions--the child of a Gosstroy experiment, created firstly to evaluate how good (but more precisely, how poor) a plan is, and secondly to propose its own more modern, economical plan solutions adhering to a strict standard--devoted itself to modifications.

"Our work here is hectic," confesses S. Utkin, the bureau's chief engineer. "Only a month is given to our experts to comprehend the plan. A month and a half for developing their proposals, supported by accurate calculations and blueprints. Nearly always we confine ourselves to periods of time that are extra-rigid. In return, a lot of time is spent on coordination and controversies with customers and planners. They don't want to modify plans or make them less expensive there. The VNIPIneft' [Petroleum Refining and Petrochemical Industry Scientific Research and Design Institute] and the "Kuybyshev-nefteorgsintez" association, for example, have been opposing the bureau for 3 years now."

It is true that now, after the bureau has been in existence for 5 years, they do not tell its staff members as in former times: don't interfere with the councils of production technology, they say--the construction workers have their own preserve [shestok], you know. Because they already know: before recommending anything, the Kuybyshev experts persistently bore into the essence of the specifics of future production facilities. They are guided by the experience of the best specialists in the sector, the knowledge of veterans, and the erudition of science. Without the aid of experts it is doubtful whether they would be able to reduce the price of building a measuring transformers plant by 800,000 rubles. Deep penetration into the technology of warehousing has made it possible for bureau staff members to fundamentally change the plan of the giant base through which 37,000 tons of vegetables pass every year and to save 750,000 rubles in its construction. It proved to be possible to reduce more than one-third of the cost of the warehouse for chemicals and materials for the production of ethylene in Novokuybyshevsk--and only because the bureau's experts have acquired a good understanding of the minute details of petrochemicals.

There's a little bureau for you! Hasn't the USSR Gosstroy truly devised a nice organization? The country is being saved many millions by 30 persons. That is why we cannot rejoice at the experiment's successes... It is awkward, somehow. Why? Because the very existence of such bureaus is a manifestation that is paradoxical, to say the least.

First of all, it assumes the age-old certainty of errors in plans. It is also absurd that the Kuybyshev bureau of experts is examining the expert opinions of the past not only in sectorial ministries, but in the Gosstroy itself. This is nothing more than an expert opinion on an expert opinion. And finally, what is most absurd: the Kuybyshev experts have thoroughly cut against the plans that already have been approved in the highest authorities. How can we not comprehend the indignation of the customers and the planners: everything went wonderfully--coordinated, signed, confirmed, approved--and you can make a fresh start! But the periods of time? And the funds? And financing?

This is difficult work, of course, but it would be worth calculating all the same how much time and money have been spent for nothing on rejected plans and the passage through all the steps of authority. But without calculations, the weightiness of the benefit of the Gosstroy experiment, which like litmus paper has revealed with deplorable obviousness the inadequacy of existing expert services, is appreciable.

Isn't it really so? Take any sectorial ministry, and everywhere small groups of experts are simply physically incapable of analyzing comprehensively and thoroughly the vast number of projects being built. And especially of supervising the execution of their own recommendations. And even purely departmental interests at times are burdensome [zastilayut ochi]. An even greater burden has been shouldered by the Glavgosekspertiza [Main Administration for State Expert Review of Designs and Budget Estimates for Construction Work] of the country and the republics. Not to mention the fact that in order to examine and propose any specific engineering solutions, the initial stage of the plan is evaluated if only roughly, and that is fine. On such a blurred background the work of six local bureaus of expert review, permeated in each movement by its own specificity, appears to be especially efficient. After all, their hands are full of trump cards: the engineering soundness of solutions, the knowledge of local conditions, and the opportunity to supervise implementation of their proposals. Participants in the Gosstroy experiment can contact customers and planners every day, coordinate and shake down [utryasat'] some details, jointly looking for the best alternatives. And they exert extraordinary influence: the very fact of the bureau's existence disciplines the planners, putting them on guard against repeated errors.

No one assumed that the bureau of experts would gather such strength. Less was intended: purely construction adjustment of the plans, without penetrating the secrets of production technology. But one is closely linked with the other, and the bureau experts, forced to become immersed in the specifics of projects being planned, began to discover vast reserves of savings here. This is why the USSR Gosstroy, convinced that its child had come of age, has given it such high authority.

So the Gosstroy experiment is useful and extremely important. The bureau of experts has shown itself to be a sufficiently effective means for construction workers to influence the improvement of plans. However, the experiment may cease to be this one day. This year the monitoring periods expire. Obviously, the concept itself is both viable and long-range. But something else also is indisputable: it urgently needs to be improved and developed, taking the sufficiently rich experience into account.

Here is what I. Bolotnikov, chief of the Kuybyshev bureau, thinks about this:

"The time has come to legalize our activity. While there is no appropriate decision, until a clearcut Decree on Bureaus of Expert Review has been worked out, sectorial organizations will ignore painlessly our solutions for the revision of plans. Measures of responsibility must be clearly defined for the planners and customers, and the bureau of expert review must be made a tool in state supervision of planning, keeping it as the working organ of construction workers, of course. The time has come to create regional centers of expert review in large economic rayons which would study plans for the most important construction projects at an earlier stage--immediately after their approval by specialists of the sector, with modification of plans to begin in accordance with the observations of departmental expert opinions. Then it would not be necessary, as it is now, to dig up all over again the plans approved in the capital."

For myself I add: the purely economic aspect of the experiment also needs improvement. Under the existing situation, the savings which the bureau experts are determining, making construction less costly, is taken into account for the contractor as work that has been carried out. On the whole, the worse (the more expensive) a project is, the better it is for construction workers: more can be saved in this. What this leads to in practice has been discussed by the newspaper in the satirical article "Dutiki" (IZVESTIYA Nos 231/232, 1983). But since construction workers must be interested in improving plans, would it not be better, taking the savings and plan fulfillment into account, to centralize the money saved in the main construction administration? And it would provide incentive to all who are involved in this savings.

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CSO: 1821/11

## CONSTRUCTION PLANNING AND ECONOMICS

### PLANNING PROCESS FOR INDUSTRIAL RECONSTRUCTION EXAMINED

Moscow PROMYSHLENNOYE STROITEL'STVO in Russian No 10, Oct 83 pp 20-21

[Article by P. P. Oleynik and L. P. Ablyazov, candidates of technical science and V. P. Volodin, engineer (TsNIIOMTP.): "Characteristics of the Development of Plans for the Organization of Construction Work Involving Reconstruction"]

[Text] The general procedures for compiling and coordinating plans for the organization of construction (POS) and and work plans (PPR) are regulated by the directive on the procedure for compiling and coordinating POS and PPR ratified by USSR Gosstroy, USSR Gosplan and USSR Stroybank [Bank for Financing Capital Investments].

In the reconstruction of operating industrial enterprises additional requirements involving the necessity of taking the features of this type of work into consideration are made upon the development of POS and PPR.

In developing POS the calendar plan for construction and the comprehensive consolidated critical path indicate the composition of work during the preshutdown, shutdown and post-shutdown period based upon the minimization of reconstruction work time involving the complete or partial shutdown of the production process.

Organizational-technological schemes and methods of work are selected with a view to the influence on construction-installation work, their compatibility with the basic activities of the operation being rebuilt, and with a view to their implementation within the existing general plan at the enterprise (operational activity of the enterprise, nature of the production areas' layout, planning and design decisions of buildings and installations). The development of schemes includes measures ensuring the stability and carrying capacity of existing structures during construction-installation work and the isolation of the construction-installation work area from active production. In selecting

construction-installation work methods a list is made of jobs, the amount and methods of work in cramped conditions in which there are factors increasing the costs. There is also a determination of procedures for protecting existing equipment during the replacement of walls and roofs.

The general construction plan should indicate: existing engineering utilities and those to be dismantled and moved, hookup location of temporary utilities, buildings and facilities not being rebuilt and those to be dismantled, routes for moving construction materials, structures and equipment within the industrial enterprise and the shops being rebuilt, location of service facilities for enterprise workers and safe passageways for builders and enterprise operating personnel.

There are more extensive explanatory notes in the plans for the organization of construction work. These indicate measures supporting the joint activities of enterprises and construction organizations, the industrial enterprise's services to create working conditions for builders, intraplant and intrashop lift and transport equipment at the enterprise transferred to builders during reconstruction, worker protection and fire prevention measures which take into consideration the technological characteristics of the industrial enterprise.

The quality with which POS sections are prepared depends upon the timeliness and completeness of the information from the client. In the development of a POS the client should provide the planning organization with the following additional materials: on the composition of separate technological sections in the enterprise, possible sequences in their rebuilding and the duration for stopping each technological section to perform construction-installation work; on the sequence of dismantling and moving engineering utilities, the sites for hooking up temporary water, electricity and gas supply systems, on the amount of energy resources allocated to the client; a list of production and sanitary-service facilities allocated to construction organizations during the reconstruction work; conditions for allowing builders to use enterprise transport and lift equipment (rail, motor vehicle and bridge cranes); conditions for the use of enterprise workers for construction-installation work; zones with high temperatures, gas, equipment with high explosion and fire danger, cramped work conditions; the character of the restrictions on special types of work (drilling and blasting, pile driving and burning-welding work, surface laying of pipes, etc); character of road and area surfaces in areas of planned earthmoving work; the location of facilities damage to which during construction-installation work could cause serious consequences and human injury (gas manifolds, petroleum, oil lubricant storage areas, petroleum and gas pipelines, electric power lines, etc), areas of landscaping and other improvements and roads on the enterprise being rebuilt for which measures should be worked out to protect during reconstruction and to rebuild afterwards.

The work plan for reconstruction is developed to the same extent as for new construction, but with consideration given to the features of work at the existing enterprise. It should be coordinated with the enterprise board of directors.

In developing the PPR, the calendar plan for work and the comprehensive critical path indicate the procedures for combining construction work and the manufacturing processes of the operation being rebuilt or the duration of the temporary



shutdowns at enterprise, building or production shop during construction and installation work. In developing these sections of the work plan consideration is given to features of the compartmentalization of the buildings and facilities involved into sections and to the structure of construction-installation work. Enterprise directors assign sections and manufacturing areas to construction organizations in order to complete construction-installation work. The basic requirements in the determination of the boundaries here are the guarantee of the spatial stability of buildings and facilities and construction-installation work conditions as well as the observation of industrial safety rules for construction and industrial operations. In those cases where work makes it necessary to temporarily or completely shut down manufacturing process equipment at the shop or operation being rebuilt, the schedule allocates work to the preshutdown shutdown and post-shutdown periods.

The following additional data is needed for the development of calendar plans and critical paths for reconstruction: technical records and blueprints of buildings undergoing work, reports from the survey inspection of buildings and facilities; schedule for the enterprise to release the building or section, coordinated by time period with the enterprise administration; information on all restrictions involving the specific conditions of this production operation influencing the methods of construction-installation work completion; information on the possible times and duration for using existing railroad sidings, main transport routes, etc.

The construction general plan indicates the boundaries of sections diverted for work (shop, bay, section, area, etc.); the disposition of existing buildings and facilities not subject to reconstruction; buildings and facilities being erected, rebuilt or dismantled; the disposition of existing utility mains, distinguishing the functioning ones and the sites for connecting new lines with present ones, the mains being moved, dismantled or laid; means of transporting construction materials, machinery and equipment; safe passageways for workers in the construction-installation work zones in getting to temporary buildings and permanent service facilities of enterprises workers, zones of increased danger from construction-installation work.

In order to coordinate construction-installation work with enterprise production processes, the flowcharts indicate working conditions of construction machinery near existing buildings and facilities; the procedure for moving enterprise workers in the construction zone; means and methods of protecting manufacturing equipment and utility mains from possible damage during construction work and of protecting construction workers from the harmful effects of the enterprise (shop) production environment; special requirements for guaranteeing labor protection and preventing fires and explosions.

It is advisable that the flowcharts for complex construction processes involving large volumes of work performed prior to the shutdown of manufacturing equipment include layouts for the organization of the construction site (work zone) prior to and during the shutdown period, and in some cases afterward.

Additional materials for flowcharts include: working plans for the project under reconstruction; drawings (plans and profiles) for the installation of existing and planned manufacturing, transportation, power engineering and other equipment

and the lines tied into it, structures, devices and process pipeline layouts; organizational-technological decisions for the reconstruction and erection of buildings and facilities and methods for performing complex construction and installation work outlined in the plans for the organization of construction; additional requirements and restrictions for working in the existing enterprise, with consideration given to spatial constraints and other factors agreed upon with the client; materials from surveys of the technical condition of building structures, equipment, utilities; working conditions (one, two or three shifts or duration in hours and the "windows" granted).

Explanatory notes in the plan indicate measures for protecting the landscape: trees, bushes, grass, paths, pedestrian footways, etc.

The work plans coordinate the following with the services at the enterprise being rebuilt: work methods, deadlines for beginning and completing work in existing shops and in zones with fully used utility mains near existing construction, procedures for dismantling equipment and recovering road surfaces after completing work, procedures for storage of construction materials and structures and other problems arising in the enterprise's reconstruction. For example, in planning the removal of utility mains from the work zone, done in cooperation with enterprise services (general planning office, chief architect, department of the chief mechanic) the deadlines for completing work and the schedules for disconnecting and reconnecting utility mains are coordinated.

The high quality development of organizational-technological documentation for reconstruction work is an important aspect of improving construction organization. Improvements in the quality of POS and PPR and reductions in the time need for their development are ensured by the extensive use of standard organizational and technical solutions, norms, rules and documentation, flowcharts for the standards of planning documentation, methodological guidelines and practical aids and handbooks which are standardized with regard to content and composition.

While systematic and planned work in this area is being conducted for new construction, it is clearly insufficient for reconstruction. The "Guidelines for the Development and Introduction of POS and PPR Under Conditions of Reconstruction and Technical Reequipment" have been prepared at TsNIIOMTP of USSR Gosstroy and will be published in a massive edition in 1984. They will give methodological elaboration to that part of the chapter on "The Organization of Construction" in the SNiP [Construction Norms and Rules] on the content and composition of planning decisions and documentation for reconstruction.

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CSO: 1821/21



## CONSTRUCTION PLANNING AND ECONOMICS

### TIME LAG, INEFFICIENCY IN PROJECT PLANNING EXAMINED

Moscow STROITEL'NAYA GAZETA in Russian 13 Nov 83 p 3

[Article by V. Goncharenko and D. Porkhunov, chief design engineers, ,  
Promstroyniiprojekt: "Who Orders the Music?"]

[Text] Designers are frequently reproached for not using scientific and technical achievements or progressive experience when creating new or rebuilding existing enterprises. In general, the criticism is justified. Why does this occur?

We begin with the planning of design work. Understandably, it takes time to work out a good design, to study similar work and the latest achievements in a given sector and to estimate the costs of different variants. Frequently, however, it is just time which we do not have. We are similar to chess players in a time bind. This is by no means our own fault. In accordance with the established procedure, technical documentation should be delivered to the contractor by 1 July prior to the beginning of construction. But prior to this the design must undergo all sorts of coordination, for which 45 days are allocated. Consequently, we should have them ready by no later than 15 May. Requests for design work, however, are filled out in February, sometimes even later. Thus it turns out that a maximum of three months is allotted to work on designs. Is it really possible to do thorough work in this time?

Even if during this very short period we were nevertheless able to create a design using effective engineering solutions, materials and structures, this would in no way mean that it would be implemented. Having received the documentation, the contractor begins to "correct" it, declaring: "We don't have that, we can't do this...." Then follows the ultimatum: rework it, otherwise it will not be accepted for implementation.

Every contractor only demands changes in design decisions with increase costs. Here is a typical example. The foundations of a shop for barium ferrite powder at the Donetsk Chemical Reagent Plant was reworked by us for a sand sub-base. The Donetskmetallurgstroy [Donetsk Metallurgical Construction] Trust said that it had no sand and demanded to "set" the shop on concrete supports. Although this alternative was 250,000 rubles more and required at least 10 tons of concrete and metal, the client was compelled to agree. He had no place to go -- the shop had to be built. We attempted to stick to our decision, but we were unsuccessful.

Many such examples could be given. They have one origin -- the contractor's striving to increase the work's cost. This will make it possible for him to easily fulfill the plan and obtain profits and the material benefits linked to it. There is no defense against this arbitrary rule. While the initially worked out plan is carefully analyzed at an institute technical council and undergoes expert evaluation and various kinds of coordination, the changes made at the dictate of the builders are not seriously examined by anybody and are accepted without almost no discussion. It is they, however, which most often entail increases in project estimated costs.

It would seem that enterprise clients and their ministries would be just as interested as us in the precise execution of approved designs, this is their right and obligation. As they say, the one who pays calls the tune. The client should not be indifferent about what is played and how much it will cost. But strange as it may seem, everything is turned upsidedown here: one pays the money, while the other -- the contractors themselves -- calls the tune. What a paradox!

Project technical standards and estimated costs depend upon the time required to complete them. To put it mildly, the situation here is far from favorable. Construction often stretches out for many years and designs become hopelessly obsolete. There are changes in technology, equipment is removed from production, there are changes in the type and assortment of the intended output, new norms and rules appear, etc. In order to keep pace with the changing times it is necessary to make one correction after another and to redo already completed construction work. As a result, estimated costs grow like a snowball. Alterations, no matter how many of them there are, do not always save the situation, and the completed projects do not always meet modern requirements.

As an example, one can point to the ferroconcrete pressure pipe plant in the city of Dobropole. Its working documents were issued in 1975. Initially, it was intended to use domestic equipment at the project, later it was decided to install imported equipment with completely different sizes and technological parameters. This decision was made after the building shells had already been erected. It was necessary to replan the shops, change the foundations, alter the engineering utilities, electrical system and other items. All this, of course, cost a great deal of kopecks and did not help improve the technical and other characteristics of the enterprise.

The Khimmash Plant in Snezhnoye has been under construction for 10 years. Its technical documentation has been repeatedly altered due to changes in equipment and output assortment, construction norms and rules and the like. There will be more of this, as the end of construction is not in sight. It will not be surprising that when this enterprise goes into operation it will look so obsolete that its reconstruction should begin immediately. To blame the designers for this is like someone with a sore head blaming the healthy.

Now a few words about the situation in design work. For a long time the question has been raised about converting to the so-called variant designing. Everybody acknowledges its advantages, but the matter is standing stock-still. It all turns upon the limited resources allocated to design and research work; we are supposed to manage with 1.5 - 2 percent of construction-installation costs. This is hardly enough for a single design, to say nothing of variants.

Limitations on resources for designing take place under the flag of economizing. However, practice has long shown that economies on design are unintelligent niggardliness. The truth is clear -- the niggardly pay twice. With regards to designing it turns out to be a hundred times twice. Every ruble saved in this manner turns into large additional outlays for enterprise construction and operation. This involves hundreds of thousands and even millions of rubles. On the other hand, a carefully worked out plan ensures reductions in construction costs and improvements in operating characteristics. This is a genuinely economic approach. We are not discovering America here, all this is well known, but unfortunately attempts to save tiny amounts go under the name of good sense.

We have touched only on some of what are, in our opinion, the most important factors which now hinder the improvement of design quality. In general, design work has more than enough of various kinds of large and small problems. They await their solution. First of all, the contractors' dictates should be eliminated, and each construction participant put in their place. This requires the establishment of a procedure where contractors' suggestions for design changes would be examined only if they are aimed towards reducing work costs and improving operational characteristics of the project.

It is also quite obvious that it is necessary to compensate for the two months which designers lose because of the change of deadlines for supplying technical documentation. This requires that deadlines for filling out orders be changed, if only to the fourth quarter.

Finally, it has long been time to take practical steps towards the conversion to variant designing. It appears that it should not be introduced immediately everywhere, but gradually, either by sector of industry or by category of project. Either way it is necessary to begin. We are confident that variant designing will bring huge economic benefits to the national economy.

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## CONSTRUCTION PLANNING AND ECONOMICS

### COORDINATED SUPPLY OF MATERIALS NEEDED FOR CONSTRUCTION PROJECTS

Moscow EKONOMIKA STROITEL'STVA in Russian No 10, Oct 83 p 36-39

[Article by Yu. P. Sadakov, chief of Glavstroysnab [Material and Technical Supply Main Administration], USSR Ministry of Construction: "Improving the Organization of Material-Technical Supply to Construction"]

[Text] The June (1983) Plenum of the CPSU Central Committee once again drew attention to the fact that the entire system of economic, organizational and educational measures must be directed toward the rational utilization of raw goods, materials, fuel, energy and other resources. The purpose of these measures is the decisive turn of all plan and economic management activity and the development of science and technology and all sectors and units of the national economy toward more effective utilization of material resources.

To a significant degree, the present shortcomings in providing construction sites with needed material resources stem from the stage of preparation of the project documentation. Then they are intensified by the untimely inclusion into the plan of facilities under construction which have not been fully provided for by 1 July of the preceding plan year, by the lack of necessary planning estimate documentation, as well as by the untimely transfer of the planning estimate documentation to the site, including work blueprints for the annual work volume. This situation is also explained by the fact that the project planning organizations developing the projects and work blueprints for residential-civil construction in a number of cases do not coordinate their projected design decisions with contracting construction-installation organizations and develop projects without consideration of the established norms for material expenditure per one million rubles of construction-installation work. A similar situation is also observed in planning a number of industrial enterprises.

In many projects in residential-civil construction the expenditure of sheet metal and cement exceeds the control figures for the expenditure of these materials which were considered in establishing the material expenditure norms per one million rubles of construction-installation work cost. This excess led in 1982 to an overexpenditure of 48,500 tons of metal materials and 266,600 tons of cement on the whole throughout the USSR Ministry [Ministry of Construction]. The greatest overexpenditure in sheet metal in residential construction was allowed by: Georgian SSR Ministry (5,190 tons), Glavvolgovyatskstroy [Construction in Volga-Vyatka Main Administration] (7,650 tons), Uzbek SSR

Minstroy (4,700 tons), Glavnovosibirskstroy [Construction in Novosibirsk Main Administration] (3,060 tons), Turkmen SSR Minstroy (2,850 tons), Penza TUS [expansion unknown] (2,720 tons), and Vladimir TUS (2,630 tons).

If we analyze the situation, it turns out that the projects for residential houses of large-panel construction adopted by the construction organizations bring an overexpenditure of sheet metal in the amount of 30,700 tons, which comprises 63.3 percent of the sheet metal overexpenditure in all the residential construction implemented by the ministry.

It must be noted that the project planning organizations providing USSR Minstroy construction sites with planning estimate documentation are still not fulfilling the directives of the CPSU Central Committee and the USSR Soviet of Ministers dated 12 July 1979 No 695 regarding the compilation of reports on the need for material resources by facility and construction on the whole. The absence of such reports, particularly for facilities of production purpose, hinders the organization of material resource supply to construction sites in accordance with the project plans and estimates, which is provided by the indicated directive, and makes it impossible to effectively check the correspondence of the submitted planning estimate documentation to the established norms for material expenditure. Such a situation leads to a reduction in the responsibility of the project planning organizations for the quality of their production in terms of expending basic materials for construction. This suggests the proposal that all planning of the construction portion of industrial enterprises should be handed over for supervision by the contracting construction ministries, retaining the need for prior coordination of overall planning decisions projected by the technological project organizations with the construction organizations at the pre-planning stage of industrial enterprise project design.

The indicated order of compiling all the planning estimate documentation will make it possible to determine more effectively and correctly the need of construction sites for materials according to project plans and estimates before the start of the plan year. This will correct one of the major shortcomings in material supply to construction.

Greater than ten years of experience in material-technical supply to construction in the country through the territorial organs of the USSR Gosstab [State Committee for Material and Technical Supply] allow us to conclude that on the whole this is an expedient and effective organizational measure which will benefit capital construction. However, for some reason at present it is used only in part of the organizations performing construction-installation work, and necessary measures are not being taken to ensure the transfer of all construction sites included in the state plan for capital construction to comprehensive material supply through the territorial organs of USSR Gosstab material-technical supply by orders of the construction-installation organizations in accordance with their needs, which are determined by plans and estimates.

Aside from the indicated badly needed measures for improving the supply of materials, structures and products, a series of other problems must be solved

which affect not only the situation of material-technical supply, but also have a direct effect on the end results of building production--the operational introduction of the facilities.

Of course, a radical measure must be considered as the need for unconditional fulfillment by project planning organizations, contractors, and particularly planning organs of decisions regarding the order of site provision with planning estimate documentation and inclusion of only those facilities provided with documentation into the construction plan. However, in our opinion, a no less radical measure should be also the increased requirements of the contracting organizations to the customers and project organizations in regard to timely coordination of the design decisions in the projects for construction organization quality and completeness of submitted documentation. Those subdivisions of USSR Minstroy which deal with project planning organizations and customers on the indicated questions show not only better work indicators, including also the end results of building production, but also they are somehow able to solve all questions of material-technical supply more easily, without great complications. Among such subdivisions in the USSR Minstroy are: Glavzapstroy [Construction in Western Regions Main Administration], Vladimir TUS, Chuvash TUS, and the Estonian SSR Minstroy. In the other territorial subdivisions this work is also performed in some measure, but it is not regarded as being the most important, determining the course of construction. This is undoubtedly a major error on the part of the managers of these subdivisions.

The defense of material need "by million" which exists at the present time leads to numerous corrections in planning and implementing delivery of materials and structures. The process of examining and defending the need for resources usually takes a very long time, but it may be significantly shortened if the substantiation of need for material resources is performed using the capacities of the territorial computer centers and the Head Information Computer Centers of the ministry and the USSR Gosplan. The application of computers will not only accelerate the implementation of this work, but will also improve its quality.

At the present time, the territorial organs of the USSR Gossnab bear almost no responsibility for the fulfillment of contract work plans by the construction-installation organizations and for the timely operational introduction of production capacities and facilities. One of the main indicators of work by the USSR Gossnab organizations is goods turnover, which does not correspond with the final work indicators of the construction-installation organizations. Sometimes it is all the same to the USSR Gossnab organizations which products to ship to the construction site--metal in assortment or some other materials, since the indicator of their activity is the cost of materials delivered to the site. This is still another one of the very serious discrepancies in the joint activity of the organizations. In our opinion, in order to liquidate this discrepancy it is necessary to:

tie in the work indicators of USSR Gossnab territorial organs with the work indicators of construction organizations whom they supply with material-technical resources. It is true, however, that in order to accomplish this



it is necessary to transfer over all construction-installation organizations of the given glavstroy, TUS or republic construction ministry to guaranteed comprehensive provision of resources through the USSR Gossnab territorial organ. However, this must be done in the interests of the entire national economy;

provide funds in the overall construction estimates for awarding prizes to workers of the USSR Gossnab territorial organs, setting the award in accordance with timely, rhythmic and complete delivery of materials and products and in accordance with the project of the building organization.

The system of material-technical resource provision according to the scheme of USSR Gossnab territorial organ--construction-installation trust is presently operating only in certain oblasts and republics. For example, in the Volga-Vyatka territorial region this system (territorial organ--trust) is in operation only for Glavvolgovyatskstroy, while for the Mari TUS, Chuvash TUS and Mordovian TUS who are subordinate to the same USSR Minstroy there is already another system: USSR Gossnab territorial organ--USSR Minstroy TUS (territorial organ--TUS). The allocation of resources to the TUS already reduces the responsibility of the USSR Gossnab territorial organ for complete provision of construction sites in these rayons in accordance with the needs determined by plans and estimates.

In order to correct this clearly incorrect "order" in material-technical provision, in our opinion it is necessary to extend the operation of the system of USSR Gossnab territorial organ--construction-installation trust (territorial organ--trust) to the entire territory where construction is being implemented and to see that the regionalization of the USSR Gossnab territorial organs serving construction corresponds to the regionalization of the USSR Minstroy territorial construction administrations (main administrations).

At the present time the substantiation of need for material-technical resources according to the nomenclature of the USSR Soviet of Ministers and the USSR Gosplan by territories, translated into provision through the USSR Gossnab territorial organs, is implemented by the USSR Minstroy in the USSR Gosplan, which then transfers these resources to the USSR Gossnab and the latter transfer them to its territorial organs. In order to reduce these multiple steps, it would be expedient for the USSR Gossnab to substantiate and distribute the resources among the organizations and also to be listed as the fund keeper.

According to the effective order, the USSR Gossnab does not provide the USSR Minstroy organizations with the full nomenclature of materials and products used in construction. It does not supply fuels and lubricants, local materials, machines and mechanisms, decentralized purchases and direct purchases. In our opinion, it would be expedient to assign the USSR Gossnab to provision of USSR Minstroy organizations with all building materials and products through a single organ.

The advance stocking of materials by the USSR Gossnab for the construction ministries for the plan year is done in accordance with the base material

expenditures for the preceding year and before the development of the plan for contract work. This order of stocking cannot consider the peculiarities of work in the planned year, and the construction ministries in many cases find themselves in a very difficult position in terms of resources. In our opinion it would be expedient to establish a two-year period for planning materials delivery with a yearly breakdown and with annual correction of the envisioned amounts of materials, as well as to change either the times of planning contract work or the times of advance stocking, bringing them into line.

The existing order of non-uniform stocking of material resources by quarters cannot help to provide for the normal material needs of construction sites. For purposes of ensuring a rhythmic character in fulfillment of construction-assembly work, it is expedient that the legislative organs establish the following order for allocation and delivery of materials to construction sites: no less than 25 percent in the first quarter, 27 percent each in the second and third quarters, and 21 percent of the annual funds in the fourth quarter, with uniform delivery by ten-day periods throughout each month; For building machines, mechanisms and means of transport: 65 percent in the first six months, 20 percent in the third quarter, and 15 percent of the annual funds in the fourth quarter.

As a rule, the USSR Gosplan territorial organs do not accept materials and products submitted by the construction-installation organizations as being unneeded or unusable and accumulated as a result of non-correspondence in work planning times and their implementation, changes in the plans, or other reasons. In our opinion, the USSR Gosplan should be obligated to accept unneeded materials from construction-installation organizations at its supply bases, permitting the possibility of their exchange for other materials and products needed by these organizations.

In our opinion, there are serious shortcomings in the determination and allocation of funds for materials, which have a negative effect on the end results of construction. We consider it beneficial to legislate the following proposals in the established order:

The USSR Gosplan and USSR Gosplan should not use any reducing coefficients in determining and allocating funds for materials except for the volumes of economy in material resources provided by tasks given in the five-year plan.

In making allocations for effective types of steel instead of standard steel grades, as well as substitutes for rolled stock, pre-measured glass and other such operations, estimates should be based on real indicators for obtaining quantities of these materials, without repeating the sad experience of past years when construction sites could get neither the materials provided in the standards nor their substitutes which had been promised in allocation of funds.

An order should be established which provides for equivalent substitution of materials specified in the standards whose need can temporarily not be satisfied by the state of the resources.



All types of pipes for external networks should be allocated according to planning estimate documentation for the physical volumes of work, with specified delivery times and in amounts established in the work organization projects and coordinated with the customers.

The appropriate ministries and departments should solve the problem of full provision of residential and social-cultural-domestic construction with linoleum made on a heat and sound insulating base and with other carpeting materials by 1985.

The quota for economy of material resources should be established separately for project planning organizations, customers and construction-installation organizations.

By 1 July 1984, all house building combines, reinforced concrete product plants and wood processing enterprises of the USSR Minstroy should be transferred over to direct long-term economic ties for the delivery of metal, cement and lumber materials.

For purposes of improving the practice of material-technical supply to construction sites through the USSR Gossnab organs, in our opinion it would be expedient to have the following:

The USSR Gossnab and supplier ministries should reimburse the construction-installation organizations the material resources which they have overexpended due to forced substitution of the project assortment for non-economic grades when planning allocations to the supplier, due to substitution for other types in the process of delivery, as well as losses associated with untimely delivery of materials.

The USSR Gossnab should annually resolve the questions of compensating construction-installation organizations in the fourth quarter for delays in material deliveries in the nine months of the current year by means of redistribution of resources.

Starting in 1984, the USSR Gossnab Soyuzglavkomplekts [Enterprises Main Administrations] should provide in full volume the assortment and delivery in accordance with project-order documentation for all construction sites, regardless of their estimated cost, all types of series, name-brand and non-standardized equipment (including product assortments for its manufacture), as well as means of automation, security and fire signalling, management and control, cable-conductor products and other products, instruments and special materials in accordance with times coordinated with the customer, but no later than six months prior to the operational introduction of the enterprise.

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CSO: 1821/20

## AGRICULTURAL CONSTRUCTION

### CAPITAL INVESTMENT IN AGRICULTURAL CONSTRUCTION ANALYZED

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 9, Sep 83 pp 72-77

/Article by V. Matyushin: "Evaluating the Effect of Agricultural Construction"

/Text/ The communist party and the government of our country have repeatedly emphasized the tremendous importance of raising the effectiveness of capital construction in the interest of developing the national economy.

In the decisions handed down during the 26th Congress, mention was made of the need for "achieving radical improvements in construction and raising the effectiveness of capital investments." A number of measures are presently being carried out for the purpose of implementing these decisions.

In conformity with the decree of the CPSU Central Committee and the USSR Council of Ministers entitled "Improvements in Planning and Intensifying the Effect of the Economic Mechanism With Regard To Raising Production Efficiency and the Quality of Work," USSR Gosplan and USSR Gosstroy have approved a new and temporary standard method for determining the effectiveness of capital investments, prepared by the Scientific Council for the Effectiveness of Fixed Capital, Capital Investments and New Equipment of the USSR Academy of Sciences with the participation of USSR Stroybank /All-Union Bank for the Financing of Capital Investments/.

The prototype for this document was the standard method developed by the scientists and leading specialists of our country under the direction of Academician T.S. Khachaturov back in 1959. During the years which followed, improvements were repeatedly carried out in its many parts, with no change taking place in its overall content or in the criteria for evaluating the economic effectiveness of capital investments. The diverse branch and departmental decisions regarding the method for evaluating the effectiveness of capital investments were based upon the conditions set forth in the standard method. Thus, for a period of more than 20 years, the effectiveness of all capital investments in our country has been evaluated using the above-mentioned standard method. The capital investments were carried out only in those instances where their effectiveness was borne out by computations based upon the standard method. USSR Gosplan, USSR Gosstroy, USSR Stroybank and other organizations exercised effective control over these procedures. Such unanimity made it possible to regulate to a large degree capital construction and to raise its efficiency.

In the standard method, by way of effect and depending upon the level of the evaluation (national economy, branch, sub-branch, enterprise), use was made of indicators for growth in national income, net output, profit and economies in current expenditures. Differences were uncovered in the overall (absolute) and comparative economic effectiveness of the capital investments.

The use for a period of more than 20 years of the recommendations found in the standard method has shown that such an approach was not always justified. For example, over the past 15 years the capital investments of a production nature in agriculture were not repaid during the normative period either in terms of the indicator for growth in national income, in profits or in economies realized from a reduction in production costs.

By way of illustration, computations are provided in Table 1 which were carried out using the statistical yearbooks "National Economy for 1965" and "National Economy of the USSR for 1980."

Over the past 15 years, approximately 60 percent of the increase in national income, which amounted to 26.6 billion rubles, was obtained as a result of growth in labor productivity and a considerable portion of it was used for wages. Thus the period for paying off 267.4 billion rubles worth of capital investments in agriculture will amount to approximately 26 years ( $267.4:10.6$ ). If we evaluate the effect of a savings realized from a reduction in production costs (in 1980 agriculture had losses amounting to 509 million rubles and in 1965 -- 568 million rubles, that is, the difference amounted to a savings of 59 million rubles), then the period for repayment is computed in terms of many decades and considerably greater intervals of time than the time for using the fixed capital, in terms of its technical characteristics.

An analysis of the use of capital investments in the sphere of material production reveals that under modern conditions the recommendations found in the standard method should be used with extreme caution. Yes and the very practice of a national economic attitude towards determining the effect of capital construction is for all practical purposes not taken into account in the standard method. For example, during the 11th Five-Year Plan, in conformity with the decisions handed down during the 26th CPSU Congress, the most important directions to be pursued for raising the effectiveness of capital investments are:

...priority development for those branches which ensure stability and balance for expanded reproduction, a strengthening of the country's defensive capabilities and implementation of the Food Program;

...an increase in the resources to be used for the technical re-equipping and modernization of existing enterprises, based upon all-round mechanization and automation and the introduction of new technological processes which call for the extensive renovation and modernization of equipment.

...an improvement in construction and a reduction in the periods required for mastering production capabilities placed in operation, through the construction of production enterprises and installations, with associated production efforts, housing and installations of a non-productive nature.

These trends for raising the effectiveness of capital investments are extremely promising for many years into the future and do not coincide with the recommendations in the standard method. To the contrary, those factors which appear to lack promise in the standard method occupy an important place in the national economy. Thus a considerable proportion of the capital investments in modernization, technical re-equipping and expansion at the present time is producing a lesser effect than new construction. As a rule, this is explained by the fact that serious repair operations require the removal of many items and thus the growth in specific capital investments exceeds the anticipated increase in profits (or other indicators of the effect in terms of the standard method). However, in conformity with the decisions handed down by the party and government, one general trend in the development of the national economy is that of modernization, technical re-equipping and the expansion of existing production efforts.

TABLE 1

Capital Investments and Some Indicators for Agricultural Development			
	1965	1980	1980 in % of 1965
Capital investments in the production sphere for 1966-1980, billions of rubles	-	267.4	-
Gross social product, billions of rubles	69.1	150.2	217.4
National income, billions of rubles	42.4	69	162.7
Growth in labor productivity, %	100	167	167
Losses of state agricultural enterprises, billions of rubles	0.568	0.509	89.6

The further development of any branch of the national economy of the USSR is directly dependent upon the expanded reproduction of fixed capital and upon the construction of new capabilities and installations or their modernization and technical re-equipping. Moreover, with an increase in the amounts of reproduction of fixed capital, the importance of the effectiveness of expenditures (investments) for this reproduction increases.

The effectiveness is evaluated according to the indicators for specific capital investments, corrected expenditures, repayment periods, coefficients of effectiveness, combining of profits in different variants, monetary evaluation of construction and the indicators for installations and capabilities placed in operation. In particular, these indicators are employed extensively at those planning institutes where the effect being realized from the reproduction of fixed capital is still not being determined in a correct manner.

Nor is the problem simply one of mistakes. In some instances there is a lack of desire to carry out variants of solutions which have proven their worth if they do not furnish a reduction in specific capital investments. Experience has shown that DSK's /house-building combine/ are extremely useful to the national economy and yet more than 20 years experience in the operation of these organizations, experience associated with the expanded reproduction of these construction enterprises, has not been summarized and as yet there is no

plan for their reproduction. This is occurring owing to the fact that the DSK's, compared to precast reinforced concrete enterprises, sharply increase the specific capital investments and lower their economic effectiveness. In actual practice it turns out that each element engaged in erecting such combines is forced into solving in its own way all problems concerned with the remodeling of reinforced concrete product plants and adapting them to DSK operations.

Following the March (1965) Plenum of the CPSU Central Committee, a great deal was accomplished towards expanding and raising the level of agricultural construction as a new branch of the national economy.

The May (1982) Plenum of the CPSU Central Committee, in addition to examining measures for further developing agricultural construction, also assigned new tasks for raising the effectiveness of capital investments in agriculture. In the decree of the Plenum, mention was made of the need for raising "the responsibility of the party, soviet and agricultural organs and the leaders of construction organizations and also enterprises and farms for the effective use of capital investments and the timely placing in operation an mastering of capabilities at agricultural installations."

The Food Program calls for capital investments to be used for developing capabilities that will make it possible to increase rapidly the production of food goods, for the technical re-equipping, expansion and modernization of existing enterprises and production efforts and for accelerating the placing in operation of projects which are under construction.

In agriculture the plans call for capital investments to be concentrated on raising the fertility of lands and creating a stable feed base for animal husbandry and capabilities for the primary processing of goods, for the construction of warehouses and storehouses, for the modernization and expansion of animal husbandry facilities and also for the social development of the rural areas. During the May (1982) Plenum, the CPSU Central Committee defined measures for improving the organization of agricultural construction, developing its production base by creating capabilities for the production of sets of light structures of a raised plant readiness and increasing the production of local construction materials.

The implementation of a grandiose program for capital construction in the rural areas during the coming years is raising a persistent need for analyzing past activity in this area.

It is significant that all construction in the rural areas is carried out on the basis of technically and economically sound plans. In the TEO /technical and economic justification/, the effect to be realized from planned construction is determined in complete conformity with the recommendations set forth in the standard method. No information is available on mistakes embodied in the computations carried out. Yes and it is difficult to expect such information to be available, since state control over the correctness of the computations in the TEO is being exercised in all areas throughout the country.

However, there was not one building project which could have produced the expected effect. The fragmentary information of some agricultural leaders concerning the ineffectiveness of production installations that had been erected was not taken seriously. As a rule, the planners, builders or those who mastered the capabilities and installations placed in operation were blamed for the deviations from the computed effect. The deviations were general in nature and, it follows, they truly reflected the branch level achieved in the development of productive forces, that is, they were an objective reality. However the basis for the computations -- the standard method -- was not called into question nor considered. And up until now construction has been justified and capital investments allocated if the methods employed in the computations were those recommended in the standard method.

Experience has shown that under modern conditions the standard method requires a radical and basic review. This is borne out by the following. First of all, all capital investments in agricultural fixed productive capital over the past 15 years have not paid for themselves within the normative period or even close to it. Secondly, over the past 15 years the pool of agricultural equipment has been replaced more than four times and this means that the totality of power and operating machines in agriculture is being used just slightly more than 3 years. For certain types of equipment, it is still possible to justify somehow such a short period of use. However, for the totality of technical equipment available, this can be explained only by an unlimited and uncontrolled allocation of machines and equipment on the one hand and by a ruthless attitude towards equipment being made available on a cost-free basis on the other.

Thirdly, of the 197.2 billion rubles worth of capital investments used, according to our computations, over the past 15 years for the expanded reproduction of fixed productive capital in the form of buildings, installations and other objects of long-term use, 71 billion rubles worth or 36 percent did not produce an increase in the fixed capital (see Table 2)

An analysis of the dynamics of growth in individual types of agricultural capabilities during these same 15 years revealed that the amount of animal husbandry facilities placed in operation was greater by several times than the increase in the number of livestock. Thus, during the 15 years almost three cattle billets were built per head of increase in the herd, for hogs -- almost 4 and for sheep -- more than 7.5 billets. As a result, new facilities were provided for 54.8 percent of all of the cattle, 73.9 percent of the hogs and 62.8 percent of the sheep.

The existing standard method for determining the economic effectiveness of capital investments has furnished assistance for many years in the use of such an approach for capital investments. It makes it possible to prove that which cannot be demonstrated and to reveal the advantages of eliminating not only certain operational installations but also the settlement of entire villages and towns. As a result, a reduction takes place in the volume of agricultural production, poor use is made of the land and economically sound capital investments in agriculture are less effective than similar expenditures in other branches of the national economy.



TABLE 2

Dynamics of Fixed Productive Capital for Agriculture and Capital Investments  
In It (computed using statistical yearbook data)

	1965		1980		Capital Investments for 1966-1980, in billions of rubles	Difference Between Capital Investments and Increase in Capital, billions of rubles
	Bills. of Rubles	%	Bills. of Rubles	%		
Fixed Productive Capital, total	77	100	238	100	-	-
Including -- reproduced by means of capital investments	63.7	83	213.2	90	287.4	-138
Of which amount:						
power and operating machines and equipment	16.9	22	40.2	17	90.2	-67
buildings, facilities and other fixed productive capital	46.8	61	173.0	73	197.2	-71

At the present time, the fixed productive capital of agriculture constitutes 13.6 percent of the fixed capital of the national economy, that for construction -- 3.2 and industry -- 31.6 percent.

The existence in agriculture of 238 billion rubles worth of fixed productive capital, a large portion of which was placed in operation during the past 15 years, serves to underscore the need for searching for means for intensifying its utilization and it also points out that the path of extensive development has practically exhausted its usefulness and does not produce the desired results, despite the technical-economic justification for the existing methods.

As early as 1970, more than 60 percent of all capital investments in industry were employed for modernization and the expansion and technical re-equipping of existing production operations. In agricultural production construction, this proportion was so low that the USSR TsSU /Central Statistical Administration/ did not even publish information on the re-equipping and modernization of agricultural production installations.

In order to accelerate the technical re-equipping and modernization of existing production operations in industry, the plans called for organizational-economic measures aimed at interesting enterprises in carrying out this work. For the purpose of creating additional conditions for accelerating the work of technical re-equipping and modernization, the leaders of production associations and enterprises were authorized to approve the title lists for these purposes regardless of the overall estimated cost of the work and to employ correction factors for the planned norms, including overhead expenses which take into account the specific conditions for performing work in existing departments. The issuing of bonuses for carrying out technical

re-equipping work, in the amount and manner prescribed for modernization was also authorized.

A large proportion of capital investments is still being used for modernization and technical equipping in agriculture, mainly for renovating the pool of equipment. A typical feature of modern agriculture is the desire to eliminate installations which could continue to be of great use for many decades. As already mentioned, over the past 15 years from 3 to 7.5 livestock billets have been built for each unit of increase in the number of animals. This indicates that livestock facilities which could still be employed for many decades are being destroyed in a systematic manner throughout the country.

There are many reasons for such an attitude being displayed towards facilities which were built earlier. One such reason -- the comparative ease in solving new construction problems owing to the subjective characteristics of individual construction leaders and the free nature of expenditures. Modernization and technical re-equipping is being held up by complicated formalism. This is clearly observed during a comparison of the potential of a plant director and that of a leader of an agricultural enterprise who is equal to the former in rank. For the most part, a plant director solves the modernization problems himself, using his own initiative he can make a department out of a warehouse or he can change the production specialization of any department. As a result, for example, the same buildings are employed for many decades at the plants.

Another situation prevails in agriculture. Here modernization requires the consent of an institute of Gosbank, which in turn requires coordination with a non-departmental planning institute. The latter insists on the introduction of a "fresh" standard plan for new construction. This plan clearly rejects a traditional building system for the rural area and brings about the demolition of buildings and installations which have not lost their use value. And if the traditional building system was justified and truly useful to the rural areas under the given specific conditions, then the effectiveness of the new construction is problematical to a definite degree and is computed only in documents. The specialists are aware that the calculations of the planners have not as yet been borne out in actual practice and thus a hasty decision in this work is not justified.

An analysis which we carried out revealed that during the 15 year period 71 billion rubles worth of capital investments did not produce an increase in the fixed productive capital, since the majority of this capital was used for the replacement of buildings (installations) which had been torn down. A considerable portion of the installations which were eliminated could have been utilized if they had been re-equipped in the proper manner. This factor alone, over the past 15 years, would have made it possible for the national economy to realize considerably greater advantage from the annual use of several billions of rubles worth of capital investments and a corresponding proportion of material and other resources. Modernization work, especially for animal husbandry facilities, is very advantageous. For example, over the course of two summer seasons at the Kolkhoz imeni Radishchev in Smolensk Oblast, while the cattle were out on the pastures, the livestock facilities were completely renovated. The capacity of these facilities increased by



almost 40 percent and the number of service personnel decreased by 50 percent. Instead of the 3 million rubles required for new construction, only 200,000 rubles were expended for modernization.

Certainly, it should be taken into account that increased specialization and the development of integration are creating objective prerequisites for increased expenditures for the modernization and technical re-equipping of agriculture.

At the same time, other conditions must also be considered. First of all, the rule should be established that the tearing down (destruction, removal) of buildings and installations which have not yet exhausted their social use is completely unacceptable. In rare instances, exceptions can be made to this rule, but there must be very sound reasons for doing so. Secondly, a requirement exists for expanding the rights of a leader of an agricultural enterprise with regard to the modernization of production installations or the remodeling, for example, of a poultry or calf house.

Beyond any doubt, these actions will not solve all of the problems or exhaust all of the potential opportunities for making the best use of agricultural capital investments. However the use of these factors is making it possible to reduce substantially national economic losses caused by the unjustified elimination of costly buildings (installations), which still possess some use value.

Modernization in the rural areas has still not become a common occurrence mainly owing to weak training for the agricultural specialists. However, there can be no doubt but that in the foreseeable future the principal proportion of capital investments in agriculture will be employed for modernization and technical re-equipping. In addition to the social-economic prerequisites, the technical solutions are also available for accomplishing this. For example, production construction in the rural areas in recent decades has as a rule been carried out using standard plans which provide for the subsequent modernization of the facilities (wide spacing of columns, improvements in power supply, protective measures). Under these conditions, a requirement exists for reviewing the existing method for determining the economic effect from capital construction in the rural areas and for creating a standard branch method which by its very nature will promote the interests of the national economy, the branch and each element of the branch.

The standard method evaluates the effect of capital construction depending upon the amount of increase in national income or a part of it (profit, net income). This is the correct approach.

There is another inaccuracy: this type of effect is presented by the standard method as being priority in nature. And indeed the manifestation of the effect of capital investments is complex in nature.

The purpose of capital investments is to satisfy completely the specific and constantly increasing requirements of the national economy. And this goal can be achieved through the observance of definite conditions, including that of revealing the true requirements for capital construction. This implies that

capabilities and installations must be developed to conform with the requirements for them and that their appearance will make it possible in actual practice to satisfy the vitally important interests of the population and the national economy.

A requirement also exists for determining in a more sound manner the degree to which the requirements conform to the technical-economic and social characteristics of the capabilities and installations placed in operation. The failure to take this circumstance into account in production construction can lead to a situation wherein a considerable proportion of the capabilities placed in operation is not utilized in the planned volume generally or for an extended period of time. And although there may be "objective" reasons at all levels for each of these instances, nevertheless it comes as a surprise that these "reasons" were not taken into account prior to the commencement of construction and the expenditure of many millions of rubles.

The usefulness of modernization and technical re-equipping is evaluated as a rule depending upon the degree of increase in production or reduction in expenditures. Such a consumer character cannot be considered as the only correct solution. We are of the opinion that modernization and technical re-equipping in agriculture must be constant in nature regardless of expenditures, provided that such development of capital construction, while causing a minimum of harm, does not disrupt but rather develops the micro-environment and the usual lines of communication and improves the conditions for vital activity by a rural worker.

The above tends to indicate that the chief goal of capital construction is that of labor expenditures, time and resources invested in things which are of maximum benefit. And only after this is the means for increasing the useful character of a thing, with minimal expenditures of labor and material and financial resources, considered to be an important factor. On the one hand, this promotes preservation of the existing potential and prevents the disruption and destruction of that which is useful, while on the other hand it brings about an increase in national income and profit and reduces production costs.

Consideration must be given to the problematical nature of carrying out an evaluation based upon an increase in national income or a portion of it that is the result of an investment of live labor during a given year. A desire to increase it can be ensured through the development of labor-intensive production efforts. But this type of approach is not in accord with the goals for a developed socialist society.

The complicated nature of the approach for evaluating effect using the standard method and the indicators for profit, production cost and specific capital investments derives from the fact that these indicators are derivatives of the construction volume, expenditures and prices. In existing practice, the prices for industrial products are reviewed by five-year plans and for construction -- once every 10-15 years. Since an economic justification and determination of the effect in time by no means coincide with the cycles for reviewing prices or with the completion time for the construction, the existing method for determining the predicted (expected) effect of capital construction becomes uncontrolled.

In addition, when determining the effect, the standard method negates the possibility of employing individual factors, the use of which would make it possible to determine more accurately the effect of capital construction.

The failure to take into account the economic effect of amortization on renovation leads to a situation wherein the entire economic process of expanded reproduction of fixed capital (resources) is disrupted. This occurs owing to the fact that the various norms for amortization deductions take into account the wear and tear and to a certain degree the obsolescence of those resources (capital) for which these norms were intended. It would seem that under these conditions the total amount of the amortization deductions would be adequate for the expanded reproduction of that capital for which they were computed. And actually a comparison of the data reveals that a considerable portion of the amortization for renovation in industry, transport and communications was employed for the expanded reproduction of fixed capital. Moreover, this is the portion which testifies to the fact that amortization for renovation is aimed not so much at completely restoring worn out fixed capital (resources as it is at reproducing completely different fixed capital of a production or non-production nature.

As a result of such manipulations, a devaluation takes place in the very forms of amortization, the amount of which is practically impossible to evaluate in the process of expanded reproduction.

Several methods are available for improving the work. For example, a return to the past and abolishing the amortization norms generally and establishing their overall amount in the financial plans as a mandatory type of expenditures and sources for the reproduction of fixed capital.

If we take into account the degree of wear and tear and obsolescence of the means of labor using amortization, then the norms should be differentiated not only by types but also depending upon the time of use of the means of labor. In this instance a flexible norm scale should be established which becomes greater as more use is made of a particular type of equipment or installation. Such an approach is justified owing to the fact that with the passage of time fixed capital (resources) loses its quality characteristics and ability to ensure the thrifty production of high quality products. At the same time, the more these resources are used, the greater the expenditures required, with the passage of years, for maintaining them in the condition required for operation. Under modern conditions and owing to the absence of flexible norms, technical resources are quite often held too long, since the expenditures for their maintenance in the form of amortization deductions are negligible.

However, for any solution variant, the amortization deductions should either be taken into account in the computations of the effect of capital construction or they should be abolished altogether. In the latter case, the country's amortization fund should be defined in the plan for the redistribution of profits, since this is considerably more simple and more convenient than the present accounting method.

An analysis of management practice reveals that under modern conditions the accepted system for evaluating the effect of capital investments, reinforced by

the standard method, is in need of further improvements. Emphasis upon evaluating effect based upon production profitability or upon individual capital investments has not proved its worth, despite the fact that it made it possible to regulate somewhat the distribution of the limits for capital investments. Moreover, in some instances this method of evaluation led to irreversible consequences. In particular, complications developed in agricultural production and its efficiency declined. To a certain degree, this occurred owing to the use of an incorrect approach being employed for evaluating the effect of agricultural capital investments.

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CSO: 1821/14

## AGRICULTURAL CONSTRUCTION

### GROWTH OF RURAL HOUSING FACILITIES NOTED

Tatar ASSR

Moscow SEL'SKAYA ZHIZN' in Russian 16 Sep 83 p 2

[Article by M. Nagavev, first secretary of the Zainsk gorkom of the CPSU, Tatar ASSR: "Quite a Lot Has Been Done, But We Need to Do More"]

[Text] Our rayon is close to the giant motor vehicle plant, KamAZ. New cities have grown up alongside it, industry is developing rapidly, and there is no end to the advertisements: "Wanted," "Come to work for us," "We are training specialists" and others like these. In short, the advertisements are attractive to many people. The rates of migration from nearby towns and villages far exceed the natural rates defined by the demographers. There was a time when the rayon lost more than 1,300 residents in a year, mainly young people. Can you imagine? Every able-bodied individual was especially important on the kolkhozes and sovkhozes. And there was a special need for the development of agriculture in the suburban areas!

We began building livestock complexes, expanded the area of irrigated land and obtained additional modern equipment. In other words, it became realistically possible to industrialize and intensify agricultural production, and the youth began taking a different view of farm work. However, ... construction rates for housing, cultural and personal service facilities lagged far behind the construction of production facilities. Only 16 percent of all capital investments on the rayon farms was applied for these purposes during a 10-year period.

The CPSU gorkom was concerned about all of this, of course, especially since party decisions directly indicated the need to eliminate the disproportion as rapidly as possible.

We began our effort to attract and retain personnel in the rural area by stepping up housing construction. The task was of concern to everyone, but it was somewhat difficult to accomplish. We lacked experience, and there was no clearly conceived system for developing the communities. Many of the farms lacked plans for laying out the settlements. On some kolkhozes and sovkhozes, it should be frankly stated, they began to build any way they could. A total of 7,000 square meters of housing was built in the rayon towns during the 10th Five-Year Plan, and most of that lacked municipal conveniences and engineering development, heat was frequently provided by ovens, and there were at best only communal storage units.

This was not a thorough solution to the problem. The people did not develop private plots--the situation did not permit this. While working on a kolkhoz or sovkhoz, they continued to obtain their food from the public stocks.

The matter was extensively discussed in the collectives of kolkhozes, sovkhozes and the construction organizations with specialists and planners invited to take part. It was then brought up for discussion at a plenum of the party gorkom and a session of the rayon soviet of people's deputies. It was firmly decided that further development would proceed only in a comprehensive manner according to general plans, which specified the most efficient distribution of housing, roads, cultural and personal service facilities, medical and trade services, schools, children's establishments and public service facilities. The "Tatkolkhozproyekt" institute in Kazan and its Nizhnekamsk branch developed plans for laying out the central settlements of all the rayon farms. The headquarters headed by the secretary of the party gorkom took on the operational supervision and coordination of the work of all the construction organizations and the monitoring of the program's fulfillment.

We began with one of the most backward and unfertile farms--the "Krasnyy partizan" sovkhoz. The comprehensive development was carried out by contract subdivisions, sponsored by city enterprises and by the sovkhoz itself. The central settlement was literally transformed in 2 years. A new street of well-designed and outfitted, single houses and duplexes with several rooms, a large kitchen-diningroom, a basement and other household areas, came into existence. Next to them were 10 hundredths of a hectare for private plots and outbuildings for livestock and poultry. Heat was delivered to each apartment from a central boiler room. The apartments had hot and cold water, a sewage system and gas. There were street lights. The street and the sidewalks were covered with bituminous concrete, and trees were planted along both sides. The town and the dairy complex were linked to the city with a concrete highway. A cultural center, a dining hall, a kindergarten, a general personal-service facility, a medical center, stores and a communications section were built.

"Eating brings on the appetite" as they say. We now see that we can and must continue the development work. The large amount of work already accomplished, however, has rapidly produced a practical effect. Suffice it to say that the sovkhoz is now totally provided with personnel in the leading occupations. The youth return here after serving in the army. People have also moved here, who at one time preferred working in industry to farm work. Some individuals are hesitant to use the words "yours" and "ours" when discussing changes in their native village, which they abandoned at one time and which they did not help to restore. That is all past, however,...I can say with satisfaction, however, that this sovkhoz has gone from a lagging farm to a progressive sovkhoz in 5 years.

The comprehensive renewal of central settlements under general plans, strictly observing prescribed proportions for housing, cultural and personal service and production facility construction, has also become the basic policy in the construction of towns in our rayon. At the present time this work is underway on the "Rossiya" kolkhoz and Kolkhoz imeni Lenin. We shall then begin working on another 4 farms where preparatory work based on planning estimate documentation is already underway.



The developemnt of a unified policy and the active involvment of city and rayon organizations in this matter helped to considerably accelerate the construction and development. A total of 11,550 square meters of housing was ready for occupancy in the rural area during the first 2 years of the 11th Five-Year Plan. Housing construction by individual builders--the kolkhozes and the sovkhos workers themselves--have stepped up. The farms helped them. A total of 43 such homes have been built during the past 2 years. This is only the beginning, however.

On the rayon scale, I could cite some fairly impressive figures for the construction of clubs, cultural centers, hospitals, schools, kindergartens, stores, and dining halls. All of this, along with the housing construction, has entailed the expansion of various services and concern for the development of the communities. The central settlements of all 20 kolkhozes and sovkhos in the rayon have now been linked to the rayon center with good roads for dependable year-round travel.

In the decree passed by the CPSU Central Committee and the USSR Council of Ministers "On Measures to Further Improve Housing, Municipal and Personal Service, Social and Cultural Living Conditions for the Rural Population" an important role is assigned to construction industry enterprises and to city and rural housing construction combines. Subdivisions of "Kamgesenergostroy" are operating in our rayon. During the past 10 years these leading organizations have applied 14.4 million rubles worth of capital investments in rayon towns. Only one seventh of this is being used for the construction of housing and social and cultural facilities. During this entire period not a single home of the type designed for central settlements has been erected in the rural area. We have a great deal of difficulty concluding contracts for housing construction, and when we do it is ordinarily for multistorey housing. I do not need to point out that high-rise apartments are not suitable for the rural resident.

Unfortunately, the situation in our "Tatkolkhozstroy" construction combine in Zainsk is not much better. It has a capacity of 85,000 cubic meters of reinforced concrete products and has mastered the production of totally prefabricated duplex houses of the type designed for central settlements with out-buildings also manufactured at the plant. Last year it turned over 110 of these houses, more than 40 of which were for our rayon. People are very anxious to move into such farmsteads.

But there are not enough of them! The combine's capacity and its production area would make it possible to increase the output of such homes to 300 a year within the near future and without additional special outlays. This would be 600 convenient apartments. The rate of the increase is such that it has taken the combine almost five years to reach today's level, however. There is not enough equipment or rigging, and funds for metal and cement ordinarily do not exceed two thirds of the need. Keramzit is the most "unfortunate". A total of more than 28,000 cubic meters is needed. I believe that "Tatkolkhozstroy" and "Roskolkhozstroyob'yedineniye" could devote more attention to this promising undertaking.



On the other hand, we need to take a self-critical look at our own affairs, at local possibilities for the use of construction materials. It is a simple but thankless matter to complain about a shortage of metal and cement with construction being carried out on such a grand scale in the nation. Let us take a look at our own failings. We have not yet faced up to the task of accelerating the construction of new housing for all of the leaders of kolkhozes and sovkhoses, city and rayon organizations and enterprises. There are still farms on which the reconstruction of the villages has not been seriously undertaken, where only one or two apartments are built each year by the farms using their own materials and labor. The party gorkom and the primary party organizations are now performing a certain amount of work with this category of leaders and specialists. We cannot rely entirely upon contract organizations. In many places housing can and must be built by the farms with their own construction teams, however small.

#### Chuvash ASSR

Moscow STROITEL'NAYA GAZETA in Russian 9 Oct 83 p 3

[Article by TASS correspondent V. Ivanova, Batyrev, Chuvash ASSR; "The Heat From One's Own Hearth"]

[Text] The fact established by the sociologists that people are attached to the land most strongly by their own home has been convincingly confirmed in Batyrevskiy Rayon, Chuvashia. The youth are not leaving from there.

Never before have there been so many housewarmings in this remote rayon as we have recently celebrated. The state and the farms are building a great deal of housing for the young specialists. Most of the Batyrevskiy Rayon people like to build their own houses, with their own means, in the ancient peasant tradition. A total of 450 new houses have been built in this way during the past 2 years. These are well-built, spacious stone houses with outbuildings.

A great deal of credit goes to the kolkhoz workers. They issue long-term loans under good terms to the builders of new houses. They help them with construction materials and provide transportation. Specialized teams have been created on some farms to help the builders.

The ancient Chuvash custom of "Nime," or mutual assistance, has been revived in the communities here. The walls of the houses are erected by the entire community working together. Kolkhoz joiners, carpenters and painters, therefore, got involved in the work. They are paid at fixed rates. This is less expensive for the rural residents, and the work is performed more rapidly.

The kolkhoz municipality sees to it that the new homes have electricity, gas, heat and water, help to maintain housing in proper condition and to make prompt repairs. The rural soviet sees to it that the village streets are developed properly.

The custom by which Batyrevskiy Rayon residents build their own houses has saved the state around 33 million rubles over the past five-year period. The kolkhozes

and sovkhoses have also benefited. During this period more than 2,000 young families have planted their roots firmly here in their native area.

It was stated at the June 1983 Plenum of the CPSU Central Committee that measures directed toward the social restructuring of the villages are an organic part of the Food Program. The example of Batyrevskiy Rayon and neighboring Yal'chinskiy Rayon is confirmation of this.

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CSO: 1821/05

## HOUSING CONSTRUCTION

### FLOW METHOD ADVOCATED TO ACCELERATE HOUSING CONSTRUCTION

Moscow BYULLETEN' STROITEL'NOY TEKHNIKI in Russian No 10, Oct 83 p 2-5

[Article by V. F. Illarionov, deputy director of the Central Committee Section of the Professional Union of Workers in Construction and Industrial Construction Materials: "Building Housing by the Flow Method"]

[Text] The 26th CPSU Congress named the scope of residential construction which has unfolded in the country as our great social achievement. This is confirmed by the entire course of implementing this most important social program of the Soviet people. In the past two years alone, over 213 million square meters of overall residential housing have been introduced into operation, general education schools for over two million students have been built, as well as pre-school institutions for 1.1 million pupils, hospitals with 127,000 beds and a number of other cultural-domestic facilities. The mastered capital investments in residential construction in the past two years have increased by 15.6 percent as compared with 1980.

The provision of overall area per single resident comprises 13.5 square meters in the cities and 14.6 square meters in rural areas. By 1985 the housing area will be brought up to 13.9 square meters in the city and to 14.9 square meters in rural areas for each resident.

The resolution of the CPSU Central Committee adopted in the current year, "On Measures for Ensuring Fulfillment of Plans for Construction of Residential Houses and Social-Domestic Facilities", is directed toward the solution of this complex social problem. Complex and crucial problems are facing builders in the current year. The plans call for the operational introduction of residential houses with overall area of 106.6 million square meters, schools for 795,000 students, hospitals with 52,000 beds, and a number of other facilities of cultural-domestic function.

In order to realize these projections and to prepare a broad front for subsequent years, it is necessary to eliminate the significant shortcomings, to mobilize the available internal reserves, and to make broader use of the experience acquired by leading collectives.

Builders have someone to set the example and someone to learn from. Tens of house building combine collectives and trusts have completed their assign-

ments for the first two years of the five-year period ahead of schedule and are performing outstanding work in the current year. A brilliant example of selfless labor on the pre-schedule fulfillment of plans and socialist responsibilities in the third year of the five-year period is being exhibited by the Communist Labor Collective of the Belotserkovskiy House Building Combine under Kievoblpromstroy [Kiev Oblast Industrial Construction Main Administration]. It reported completion of the two-year program ahead of schedule. In addition to the plan, residential housing with overall volume of almost 22,000 square meters was introduced into operation. Based on the further development of technical progress and the introduction of leading labor methods and progressive technology, the combine has completed its transition to the flow system of organizing building production. Instead of small non-coordinated work brigades, large effective collectives have been created at the enterprise and a method of planning and supply with materials and structures for an enlarged work crew has been introduced after the example of the Vinnitsapromstroy Combine.

The assembly of housing at the Belotserkovskiy House Building Combine is done on a conveyor according to the "plant--transport--construction site" method. The open flow order has made it possible to introduce precise work at all segments of the technological flow and to avoid idle time and work stoppage. The assignments for operational introduction of housing are over-fulfilled every month. The construction start program is apportioned equally by months. The graphs on work production are strictly observed.

For over 20 consecutive years the collective of the country's well-known Tallin House Building Combine has been working rhythmically, achieving not only fulfillment of the on-going construction program, but also the reduction in cost of one square meter of housing area. Reconstruction is presently being done at the combine in Tallin. Upon its completion, the enterprise will be able to manufacture houses of new, improved series. There is also much to be learned from the organization of labor and increased effectiveness of capital investments at the Leningrad and Moscow house building combines, at the Kharkov House-Building Combine, at the combines in Donetsk, Alma-Ata, etc. This positive experience is being generalized by the ministries and administrations, and by the Central Committee of the Professional Union for Workers in Construction and the Building Materials Industry. New beginnings and valuable initiatives are being engendered in the course of socialist competition. The collectives of the Minvostokstroy [Ministry of Construction in the Far East and Transbaykal Regions] subsections are competing under the motto "Leading Pace to Housing Construction!" in the current year. The responsibilities of the labor collectives are confirmed by engineering computations corresponding to organizational-technical measures. Last year the builders of Transbaykal and the Far East successfully realized the task of housing introduction and are today working at an increasing pace. Their patriotic initiative on housing construction ahead of schedule has been praised by the Minvostokstroy collegium and the professional union Central Committee.

The professional union Central Committee in conjunction with the ministries and departments has praised the initiative of leading collectives in the sector on the accelerated construction of residential housing. For the first

time in the current year, socialist competition has been organized among the collectives of the largest glavks [main administrations] engaged in residential housing construction in Moscow, Leningrad, Kiev, Alma-Ata, Tashkent, and Baku. The generalization and promulgation of the experience of these leading collectives will facilitate the development of mass socialist competition and increased effectiveness of residential-civil construction in the country.

This year new conditions for All-Union Socialist Competition have been ratified, where the basic indicator includes plan fulfillment on the introduction of housing and social-cultural-domestic facilities. Without fulfillment of this indicator, the economic managers and professional union committees will not present the collectives for consideration for first-class awards. This will even more greatly increase the role of socialist competition in mobilizing the collectives for the fulfillment and over-fulfillment of plans for residential-civil construction.

As before, in achieving the best results in labor with the least expenditures, an important role is given to such a specific form of production management determined by the builders themselves as the brigade contract. Self-supporting brigades have become true laboratories for leading methods of labor and schools for training the working man. At the present time, over 82,000 brigades are working in the sector according to the method of N. A. Zlobin. This progressive method last year fulfilled 42.1 percent of the overall volume of construction-installation work. It is notable that this method of organizing construction is most widely used in erecting housing and social-cultural-domestic facilities. In the second year of the five-year period, self-supporting brigades realized 62 percent of the work. This included brigades of the USSR Minstroy [Ministry of Construction]--72 percent, Minvostokstroy--57 percent, and USSR Minsel'stroy [Ministry of Rural Construction]--56 percent.

The brigade contract makes it possible to seek out and boldly introduce internal reserves into production. And wherever the matter is approached with initiative and creativity, success is invariably achieved. For example, the brigade of I. D. Ganchev from the Nikopol'stroy Trust of the UkSSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises] which is well-known in the sector last year submitted for operation 18 residential houses with total area of around 100,000 square meters. The construction time was reduced by 13 days. The brigade's output per worker was over 95,000 rubles. A savings of 47,000 rubles was achieved. Both the wages and the prizes are higher in this collective than in the others. Here they are directly associated with the end results of the work.

Nevertheless, the possibilities of the brigade contract in residential construction are still insufficiently utilized. It is much easier to introduce the brigade contract for the construction of housing, children's pre-school institutions and cultural-domestic facilities which as a rule take no more than a year to build than it is to apply it at large industrial facilities. Therefore economic managers and professional union committees must give this work sector primary consideration. It is necessary to create all the conditions

for highly productive and effective labor according to the method of brigade cost accounting and to not permit the transfer of brigades from site to site, particularly at the end of the year, as well as the disbanding of brigades.

The task consists of bringing the relative share of construction-installation work performed in housing construction by the method of brigade cost accounting to 80-85 percent by the end of the five-year period and of transferring house building combines in general to a flow brigade order. The recently ratified new position on open brigade cost accounting will facilitate this end.

The introduction of achievements in scientific-technical progress, the improvement of organization of building production and the application of modern achievements in architecture and the rich legacy of folk architecture have allowed our urban builders to achieve significant success in comprehensive building of new cities and microregions and in reconstruction of historic centers. In the current year, a large group of urban builders has been awarded the prize of the USSR Soviet of Ministers for their outstanding projects and construction. Among these works are "Large-Panel Residential Houses Made of Block-Sections of the Regional Series '111-121 Ch'" in the Chuvash ASSR based on the example of construction in Cheboksary, "The Complex of Structures for Water Supply to the Southwest, Southeast and Southern Rayons of Moscow", "The First Order of Building in the City of Kirishi, Leningrad Oblast", "The Public-Residential Complex '305' in Murmansk", "The Vtoraya Rechka [Second River] Residential Region in Vladivostok" and others.

Undoubtedly, much has been accomplished, but there are also still significant shortcomings in the organization of residential construction. The construction ministries and departments are slow in implementing the transition of housing construction to progressive series of houses. In the current five-year period, approximately 96 percent of the houses are erected annual according to standard projects. Of these only 53 percent are built according to new projects. In a number of areas efforts are being made to build more houses of increased story height according to individual projects, which increases the cost of construction by 10-15 percent. Thus, for example, last year 25 percent of the houses were built according to individual projects in Pavlodar, and 22 percent of the total number of houses in Kalinin. This percentage is also high in construction in Sevastopol and a number of other cities.

We have the necessary capacities for realizing the program for residential housing construction envisioned by the party. Presently in the country there are around 500 enterprises engaged in industrial house building in operation, with a total capacity of approximately 60 million square meters of overall area of fully prefabricated houses per year. However, only 219 enterprises are in operation within the system of house building combines. Here the available capacity of large-panel house construction is utilized by only 76 percent. In a number of organizations this indicator is significantly lower. Thus, the Large-Panel House Construction Plant of the Ryazan House Building Combine under the USSR Minpromstroy [Ministry of Industrial Construction] is working to 38 percent capacity, the Dushanbinskiy House Building Combine of the USSR Minstroy--to 55 percent. And there are many other such examples. According to the data of the USSR Gosstroy [State Committee for Construction Affairs], already in the current five-year period the increased



utilization of large-panel housing plants to 85-90 percent will make it possible to place into operation additional fully prefabricated residential houses with overall area of 7-8 million square meters per year. This problem is fully soluble. The necessary aid to the contracting organizations must be given by Minstroydormash [Ministry of Construction, Road and Municipal Machine Building], which manufactures equipment and outfitting for the house building combines.

We must say that to the present time we still have no clear technical policies on planning house building combines. There are no standard decisions for the foremost technology, which has recommended itself so well in practice. Labor expenditures and fuel and power consumption for the production of the same products at different house building combines vary by 2-3 times. There are tens of methods of product heat processing in plant production. The situation with industrialization of construction on a mass scale in cultural-domestic buildings is extremely poor. Their degree of prefabrication over the past years has undergone almost no growth and remains at a level of 20 percent. A faster transition should be made to the construction of fully prefabricated children's pre-school institutions, professional-technical schools and other facilities of social and domestic function, with provision made for comprehensive flow construction of blocks and microregions.

As before, the inhibiting factor in the realization of comprehensive programs of residential housing construction is the unrhythmic character of the operational introduction of facilities. As we know, the USSR Soviet of Ministers as early as 1981 adopted a resolution for increasing the effectiveness of capital investments allocated for housing construction. It was established that beginning in 1982 no less than 40 percent of the annual program of housing introduction must be planned for the first six month period. However, this order is not being implemented by numerous planning organs and economic managers, which leads to rush work and to disruption in the plans for residential housing construction. It is no secret that in the current year around half of the operational introduction program for most organizations building housing falls in the fourth quarter, and strictly speaking--in December. Wherever it is possible, the plans and graphs for housing introduction should be reviewed in order to maximally hasten their construction time and create the necessary stock for rhythmic work in the fourth year of the five-year period.

It is also time to end the faulty practice of accepting houses for operation with major items left unfinished and with inoperable systems of engineering communications. Unfortunately, there are many such examples. In the Tyumen-skaya Oblast in 1982, unfinished houses were accepted for operation with overall area of 70,000 square meters, four children's pre-school institutions for 1,200 pupils, and a surgical unit. In many of these, work had not been completed on laying floors, hanging doors, finishing the rooms, installing sanitary-technical facilities, and other operations left unfulfilled. In Baku, 23 multi-story buildings were not occupied for two months due to unfinished work.

Construction defects in new houses in the Ts-14 microrayon in Tashkent were not corrected for five years. Many decisions were made by various organs on

this question, but the position remained unchanged until most recently, when an order was issued by the directive organs.

Strict order must be established in the existing system of accepting facilities submitted for operation. The role and responsibility of the construction organizations, professional union committees and operational organizations must be increased. The single customer service must also find itself and determine its place in this important state matter. It has been created in only 125 large cities throughout the country, and does not operate effectively everywhere at that.

In recent years, a tendency has been noted toward a certain improvement in the quality of residential-civil construction. This has been facilitated by stricter controls, the transition to comprehensive goal-oriented quality checks with the participation of society and with examination of these results at collegiums of construction glavks and republic ministries, as well as professional union committee presidiums. The problem of quality is not only an economic problem, but a social one as well. We can no longer put up with the fact that new residents often experience disappointment and annoyance upon receiving their apartments because of poorly performed work or defects.

Even though in many cities work quality has become the subject of particular concern by builders as well as operators, there are still many complaints of defects. Many state funds and personal savings of citizens are spent on correcting defects, and material means are overexpended. Only 60 percent of our houses are accepted with good or excellent ratings. Eleven thousand people are constantly engaged on correcting defects in construction. Last year over 8,500 inspections of work quality were performed in 1,224 cities and 1,575 rural rayons of the country. As a result, work was interrupted at a number of facilities and financing was revoked at 162 construction sites. Over 600,000 square meters of overall residential housing area were excluded from reports on operational introduction due to defects and unfinished work. This was primarily in Krasnoyarsk and Altay Krays, in Kemerovo Oblast, in Latvia, Uzbekistan, Kazakhstan, the Ukraine, and a number of other places.

According to the resolutions of state architectural building control organs, a number of engineering-technical workers at construction sites and house building enterprises have been fined. Over 100 persons have been brought to judicial responsibility for their disruption of plans, construction norms and standards. And is it normal that for reasons of not knowing the standards and regulations of work production, engineering-technical workers were dismissed from work or demoted according to the results of inspections by the state architectural building control organs? This is evidence of the fact that in a number of organizations, serious work is not being performed on improving the level of training of workers and supervisory line personnel.

Improving the quality of housing construction is today becoming one of the most acute problems. In connection with this, extensive work is being performed in the sector on introducing the experience of Moscow house builders working under the motto "To High Quality Construction--a Working Guarantee!". This patriotic initiative is directed at increasing responsibility for high work

quality by each labor collective at the country's construction sites. It is also necessary to activate the movement of Moscow and Leningrad workers who submit houses for exploitation with guarantee passports.

As we see, the organization of housing construction has considerable reserves. In order to rationally bring them to action and better utilize them, it is necessary to improve planning and rationally combine centralized sectorial and territorial programs. The experience of leading collectives shows that already today it is possible to everywhere set up flow-line construction and to scientifically resolve prospective questions on urban construction. Long-term construction flows may facilitate the elimination of unnecessary overloads in construction and installation organizations at the end of the year and the ordering of a system of equipment manufacture and delivery to facilities under construction. The faster the emerging problems are solved and the shortcomings eliminated, the more significant will be the economic gain and the more successful the implementation of the extensive program of housing construction in the country as envisioned by the party.

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CSO: 1821/26

## CONSTRUCTION MACHINERY AND EQUIPMENT

### MECHANIZATION TO INCREASE IN CONSTRUCTION INDUSTRY

Moscow MEKHAIZATSIIYA STROITEL'STVA in Russian No 11, Nov 83 p 2-4

[Article by V. V. Semkovskiy and Yu. S. Vostrikov, USSR Gosstroy [State Committee for Construction Affairs]: "On a Comprehensive Program for Reducing Manual Labor Expenditures in Construction"]

[Text] The June (1983) Plenum of the CPSU Central Committee defined the general reduction of manual labor expenditures and the cardinal increase in labor productivity as the key task in the sphere of economics.

According to the data of a one-time survey, in construction on 1 August 1982 the portion of workers performing manual labor comprised 61.2 percent, including 48.6 percent performing work by hand without any machines. In the past 10 years the level of manual labor has dropped insignificantly. As before, the most labor consumptive jobs remain masonry work (89.4 percent of the workers working by hand without machines), joiner-carpentry work (75 percent), and plastering, painting and resurfacing work (71.3 percent). In this period, the number of workers engaged in manual labor on the repair of machines increased by 11 percent.

The reduction of manual labor expenditures is a comprehensive and complex task. Construction ministries and departments systematically provide for measures directed at reducing the application of manual labor due to improvements in project planning decisions, increased volumes of production, application of progressive building materials and constructions, development of fully prefabricated house building, transfer of work operations from the construction site to plant conditions, creation of new machines and mechanized tools, development of comprehensive mechanization and automation of construction and assembly work, and improvement of construction and labor organization. This has been reflected in the five-year plan for economic and social development of the USSR for 1981-1985, and in the annual plans, as well as in the plans, standards and other documents developed by the USSR Gosstroy in conjunction with interested ministries and departments.

For the 11th Five-Year Period, the USSR Gosstroy together with the ministries and departments have developed and are realizing nine important scientific-technical programs and one target comprehensive program in the sphere of construction, construction materials, and construction and road machine

building. The programs provide for the creation and mastery of new building materials and building structures (reinforced concrete, metallic, wood, asbestos cement, etc.), automated technologies for their production which would meet the requirements of further industrialization of construction and ensure economy of labor resources, development and introduction of new methods for organizing construction, comprehensively mechanized technologies for production of the most mass-produced types of construction-installation work (earthwork, concrete, installation, finishing work) and new highly productive machines and tools ensuring a sharp increase in labor productivity.

The USSR Gosstroy has ratified a plan for the comprehensive mechanization and automation of construction-installation work for 1981-1985, and annual plans are being developed and ratified. Realizing the tasks set in these plans made it possible in 1982 to reduce the volumes of manual labor computed per one million rubles of construction-installation work, as compared with 1980 for construction as a whole, for earthwork--by 15.2 percent, for concrete work--14.2 percent, for plastering work--9.1 percent, for painting work--7.6 percent, and for cargo handling operations--12 percent. The level of mechanization for roofing work increased from 49.8 to 56.4 percent, and the relative share of container and packet shipments from 23.7 to 28.4 percent. The level of automation in preparing concrete mix and mortar also increased.

Based on an analysis of the state of mechanization in construction-installation work, the USSR Gosstroy with participation of the Minstroydormash [Ministry of Construction, Road and Municipal Machine Building] and the construction ministries developed and ratified a system of machines for the comprehensive mechanization of construction for 1981-1985. In accordance with this system, the enterprises of Minstroydormash and other ministries have mastered the production of mechanized instruments for installing partitions made of gypsum-cardboard slabs, of mechanized perforators, safety pneumatic jackhammers, concrete grinders and impact wrenches, and electrical instruments with electronic control. The production of plastering and painting stations, machines for roofing work, and other building technology has been introduced.

Work is being done on improving project-estimate documentation and standards documents whose quality and technical level greatly determine the degree of application of manual labor. Provision is being made for expanding the application of the brigade contract, introducing mandatory work production technology with application of standard sets and charts on labor processes, and introducing work production plans everywhere.

Nevertheless, despite the measures being taken for industrialization and mechanization of construction, the portion of manual labor, particularly in finishing and post-installation work, at small dispersed facilities and certain auxiliary operations is still great. The existing rate of edging out manual labor, particularly in recent years, has been insufficient for its sharp reduction.

The positive experience of the RSFSR, Belorussian SSR, Kazakh SSR Gosstroys and others deserves attention. Based on predictions for the development of the sector for 1981-1985, these organizations working together with the construction ministries and departments of the republics have developed and

ratified comprehensive programs for reducing the application of manual labor (TsKPRT) in construction organizations for the 11th Five-Year Period. The programs make it possible to concentrate resources on solving this important problem, to successfully resolve intersectorial questions, and to overcome departmental barriers. The tasks envisioned in the programs for development and introduction of new engineering and progressive technology create the necessary prerequisites for the significant reduction of heavy and low-productivity manual labor. In working out the programs, the construction organizations utilized various methodological directives, forms and indicators.

On 20 July 1982, the USSR Gosplan [State Planning Committee], GKNT [State Committee on Science and Technology], USSR Gosstroy, USSR Goskomtrud [State Committee for Labor and Social Problems], and VTsSPS [All-Union Central Soviet of Professional Unions] adopted a resolution on the development of a target comprehensive program for reducing the application of manual labor in sectors of the USSR national economy for the period to the year 2000.

For purposes of ensuring a singular methodological approach to the preparation of the program and determining its basic indicators in all sectors of the national economy, the USSR Goskomtrud and USSR Gosplan worked out and ratified a number of standard methodological documents.

Based on these standard methodological directives, the USSR Gosstroy, in cooperation with the Central Committee of the Professional Union for Workers in Construction and the Building Materials Industry, prepared and ratified methodological directives, forms and indicators for performing an accounting (passportization) of manual jobs and for developing a comprehensive program on reducing the application of manual labor in construction organizations. In accordance with these methodological directives, the basis for compilation of the program in the construction ministries and departments and the territorial programs are the programs developed within the construction organizations (associations, trusts, house-building combines and their equivalent organizations) and at enterprises of the construction industry. Here, special permanently operating commissions are formed, headed by the managers of these organizations and including, aside from the sector and section directors, also professional workers, mechanics, standards workers, work brigade leaders, production innovators (in administrations), directors of functional sections and services, chief specialists (in the higher ranking organizations), as well as representatives from party and social organizations.

The development of the target comprehensive program includes an analysis of the manual labor expenditures in construction, a determination of the reasons for its application, and a development of specific measures for eliminating the processes and operations presently performed by hand.

To obtain data on the application of manual labor and to determine the initial level of its expenditure, the construction administrations and their equivalent organizations perform total accounting (passportization) of the actual labor expenditures for all the types of work and professions of workers in each construction work brigade, unit or individual worker performed from 1 July 1982 through 30 June 1983. The number and professional make-up of workers engaged in manual and heavy physical labor are determined in the course of



the reporting. Manual and heavy physical operations are clarified, as well as the time expenditures for their implementation. Labor expenditures are determined according to orders and calculations, while the actual time worked by brigade (unit) workers is determined by tables.

The documentation of labor expenditures for the annual time interval makes it possible to consider the specifics of building production: the seasonality of work, the transitional character of the work site, the broad combination of construction worker professions, and other factors. The specialists of OTIZ [Labor and Wage Section], PTO [Technical Production Section], and OGM [Chief Mechanic's Section] at construction organizations, NIS [Scientific-Research Sector], TsNIB [Central Normative-Research Bureau] and the "Org-tekhstroy" trusts (institutes) must be attracted to the solution of this problem.

The data on accounting (passportization) of manual labor are the main source of information in developing measures for its reduction. Upon analysis of the accounting data, the most numerous professions of workers engaged in manual and heavy physical labor are determined, as well as their number and type and volume of work performed by these workers.

According to the results of the analysis, construction administrations and their equivalent organizations, in accordance with the basic directions for technical progress, are developing measures, while associations, trusts, house-building combines and their equivalent organizations are formulating TsKPRT on the basis of these measures. Here it is necessary to be oriented toward the maximal application of internal reserves, which do not require significant material and labor expenditures: improvement in the utilization of available means of labor mechanization and automation and introduction of rational engineering and organizational decisions.

For manual labor, whose elimination is hindered during the period of development of programs by organizations, proposals are submitted to the superior organization on the implementation of scientific-research and experimental-design work and the development of project planning decisions, organizational and economic questions.

In formulating the program, primary consideration is given to measures of a national economic and general sectorial significance which are capable of ensuring liberation from heavy physical and manual labor for the greatest number of workers, primarily women, as well as to measures which may be implemented in a short time and without significant expenditures with greatest economic effectiveness. Together they must ensure fulfillment of the established tasks for maximal reduction in the application of manual labor.

The development of TsKPRT is planned for implementation in two stages. At the first stage, indicators and measures of the preliminary TsKPRT project are developed on the basis of total accounting (passportization) of manual labor and the results of scientific studies by five-year periods as a whole. At the second stage, the scope of reduction in the application of manual labor is clarified, as is the system of measures determined at the first stage

in coordination with the volumes of allocated resources and plan indicators for economic and social development of the construction organization, ministry or department. At this stage the program indicators for the period 1986-1990 are developed by year.

The ratified TsKPRT will serve as supplements to the five-year plan for the economic and social development of organizations, ministries and departments.

The development of the program in coordination with the plan for economic and social development of construction organizations, ministries and departments makes it possible to resolve the task of reducing the application of manual labor in a comprehensive manner: by maximal transfer of labor consumptive processes from the construction site to building industry enterprises, by increasing the degree of plant readiness of structures, by introducing packet and containerized transport of construction loads, by ordering their warehousing, and by increasing the level of engineering preparation of work production. A significant reduction in the application of manual labor and acceleration of the growth of labor productivity may be achieved by equipping building organizations with highly productive machines, means of small mechanization, mechanized and hand tools, specialized auto transport, as well as improving the application of technology due to increased shift application of its work and better utilization during the shift.

Construction is a highly mechanized sector of the national economy which has at its disposal over 600,000 large construction machines and numerous other technology. Increasing the effectiveness of utilizing this equipment is the most important task at the present time.

Since construction organizations are being equipped in recent years with new earth-digging technology, the possibility has arisen for significantly reducing the expenditures of manual labor in earthwork production. This end is facilitated by the application of boring machines for pile installation used for supports for enclosures, communications and electrical lines and by the application of various equipment for trenchless laying of engineering communications under the road thoroughfare and along main automobile roads and rail lines. Each hydraulic excavator with interchangeable equipment at grading or clean-up work sites, each earth-digging, cutting and moving machine in the excavation of frozen ground, makes it possible to free 25-30 earth diggers. Construction organizations should not allow work to be done by hand in filling pits and trenches, in digging small excavations and trenches at places of entry of engineering communications into buildings and structures, in loosening frozen ground and rock, and in backfilling (except for work production defined in the project plan).

In the last five-year period, the Minstroydormash enterprises manufactured over 30,000 road construction machines with automated control (motor graders, asphalt placers, scrapers, trench excavators, etc.). The experience of their application in the construction organizations of the USSR Minvodkhoz [Ministry of Land Reclamation and Water Resources], RSFSR Minavtodor [Ministry of Highways] and Latvian SSR Minavtodor shows that the application of means of auto-

mation on all these machines significantly increases their productivity while at the same time ensuring economy of construction materials and fuel, improving the quality of work and facilitating the labor of machine operators.

However, there are often cases where automated machines are not used according to their function, when the operational personnel are not trained in time, and when their technical state is poorly controlled. Technical services must be created at construction organizations for the adjustment, operation and repair of automated machines. Also, training of personnel in the regulations of work production with the application of these machines must be organized.

A significant reduction in labor expenditures may be achieved in preparing, transporting and placing concrete mixture. Preparation of concrete mixture must be done generally at centralized automated plants and installations. The production of concrete mixing trucks and concrete haulers is being expanded and provisions are being made for mastering new standard dimensions of these vehicles for delivering concrete. Builders have at their disposal a considerable pool of concrete pumping trucks, whose application will make it possible to significantly reduce the labor consumption of placing concrete mixture. However, these vehicles are still insufficiently used.

Much has been done in recent years in developing the production of mechanized tools and finishing machines. The production of IE-4713 hand-held electric perforators has been mastered. Using these, it is possible to reduce the labor consumption of making openings in concrete structures and brickwork, cutting grooves, piercing metal, driving dowels, and performing operations by 1.5-2 times. Equipment is being manufactured for the installation of dry gypsum plastering of increased quality--an electric drilling machine with set of fittings, wood-screw driver with magnetic head and electronic regulation, as well as scissors for cutting profiled sheet metal.

The production of new highly effective electric impact wrenches for bolts ranging in diameter from 18 to 30mm has been organized for the assembly and packet tightening of threaded connections during the assembly of equipment and metallic structures.

High pressure painting units are being manufactured in great quantities. These ensure an increase in labor productivity of 2.5-3 times and up to a 30 percent savings in paint compounds. The SO-126 pneumatic force pump with productivity of 2.5 m<sup>3</sup>/hr is being produced for making and transporting thick mortar for the installation of floor support walls. This pump ensures mortar supply to a height of up to 40m. The production of plastering and painting stations, plastering assemblies and other technology is being expanded.

For the purpose of improving the utilization of small mechanization means, specialized administrations and MM [Ministry of Machine Building] sections have been created and are successfully functioning in many construction ministries and departments. They perform a number of special jobs by their own efforts, including: hydroinsulation, piercing with trenchless laying of underground communications lines, drilling holes in reinforced concrete

structures using diamond cutting tools, etc. They organize instrument-issue points at construction sites, supply the sites of the necessary means of mechanization, and ensure the work capacity of this technology. With the creation of MM administrations at the construction organizations, which are comprised of specialized MM sections, the application of small mechanization means has significantly improved, expenditures of manual labor have been reduced, and labor productivity has increased.

Increased labor productivity in roofing, plastering, and painting work has been facilitated by the application of mandatory technology for their production with work crews being equipped with standard sets of instruments.

The compilation of a comprehensive program requires the determination of the technically and economically expedient level of mechanization, the creation of progressive standards, and the selection of optimal methods and means of mechanization for each type of work. The engineering-technical workers of construction organizations, scientific-research and technological institutes, and "Orgtekhstroy" trusts and institutes must be attracted to the solution of these problems.

For purposes of effective control over the implementation of the program, it is necessary to provide for appropriate periodic accounting of labor expenditures according to types of construction-installation work.

The realization of the target comprehensive programs on reduction in the application of manual labor by the construction organizations and enterprises will make it possible to solve a number of socio-economic problems foreseen by the decisions of the 26th CPSU Congress and subsequent Plenums of the CPSU Central Committee.

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## BUILDING MATERIALS

### MOSCOW BUILDING MATERIALS CHIEF DISCUSSES INDUSTRY

Moscow MOSKOVSKAYA PRAVDA in Russian 5 Oct 83 p 2

[Article by A. Osipov, director of Glavmospromstroymaterialov [Moscow Industrial Construction Materials Main Administration]: "The Base of Construction: On the 25th Anniversary of the Order of Lenin Glavmospromstroymaterial of the Mosgorispolkom"]

[Text] The Moscow construction materials industry has come far in this quarter century. The previously uncoordinated totality of minor enterprises with their morally and physically outdated technology has been transformed into a strong material-technical base for construction.

Today, when one tries to understand the development of construction in Moscow or visits construction sites which have essentially been turned into assembly shops with an industrial work rhythm, one is again convinced how timely the decision of the party and the government was in regard to transforming the production of building materials and structures to an industrial basis and concentrating it under a single administration.

Today the Glavmospromstroymaterial enterprises turn out over 200 types of modern materials and structures and supply them to all types of construction in Moscow. This production ensures the annual introduction of over 3.5 million square meters of residential area, one million square meters of production area, numerous schools and children's institutions, agricultural facilities, unique and public buildings, and engineering structures.

Over half of the fully prefabricated residential houses placed into use in Moscow are erected entirely of materials and structures (including prefabricated reinforced concrete) manufactured by glavk [main administration] enterprises. Over 55 percent of the total labor expenditures for the manufacture and construction of these houses are put in at our plants. Thus, the industry is actively participating in the process of construction using its human and material resources and fixed capital.

The "Stroyplastmass" Combine, the Kuchinskiy Ceramic Facing Materials Combine, the Moscow Stone Processing Combine, the "Mosstroyplastmass" Production Association, the Building Materials Combine No 24, the Wood-Processing Combine No 3, the Lenin Glass Plant and other enterprises are making a great contribution to the industrialization of Moscow construction. Today the glavk includes

over 60 associations and enterprises, construction, scientific-research, design-technological and project planning organizations employing over 80,000 people.

In the past years the production volume in the main administration has increased by 4.7 times with a 4.1-time growth in production capital. In this period the labor productivity has increased 4.5 times. Ninety-seven percent of the production growth was obtained due to the growth in labor productivity. Over one-fourth of the production subject to certification is produced with the Seal of Quality. In 25 years, one billion rubles in capital investments have been spent on the development of industry, and 1,800,000,000 rubles profit has been obtained. Thus, the capital expenditures invested in industrial development have been repaid almost two-fold.

A remarkable guard of personnel workers, engineers and technicians has grown up at our enterprises, who serve as examples of high-productivity labor. The names of P. S. Fabrichnov, bricklayer at the Kotel'skiy Plant, G. F. Novikov, V. A. Korovkina and A. I. Golubeva, compositors at the Dedovo Ceramic Plant, V. P. Belozarov, lathe operator at the experimental mechanical plant, and numerous others are well known for constantly overfulfilling their personal plans.

Almost 3,200 workers, engineering-technical workers and personnel have been awarded orders and medallions for their outstanding labor achievements. This includes 68 receiving the Order of Lenin, 43 receiving the Order of the October Revolution, and 700 receiving the Order of the Red Labor Banner. The high honor of Hero of Socialist Labor has been bestowed on workers at the Kuchinskiy Ceramic Facing Materials Combine A. V. Romanov and S. F. Fedotov, on brigade leader of the Wood-Processing Combine No 3 and delegate to the 26th CPSU Congress I, F. Isakov, on operator at the "Stroyplastmass" Combine M. A. Bogolyubov, on operator at the Reinforced Concrete Products Plant No 7 D. G. Fotin, and on shop director at the Reinforced Concrete Products Plant No 5 M. S. Kostash. Fifty-eight workers became Laureates of the Lenin, State and USSR Soviet of Ministers Prize, and 59 persons bear the honorable title of "Honored Builder of the RSFSR".

Today the prefabricated reinforced concrete enterprises are manufacturing sets of structures for a fourth generation of fully prefabricated residential houses of the Unified Catalog type. Preparations are being made for mastering 17-story buildings of the Pp-70 series, which will subsequently fully replace the present ones. Catalog products are being mastered for the construction of industrial and technical structures. The wood-processing and nonmetalliferous industries are developing, as is the ceramics and binding materials industry. The synthetic finishing materials and heat and sound insulation materials industry has been created anew. Important measures have been implemented in industry on improving working conditions, developing public dining and trade enterprises, improving domestic services, and strengthening the material base for public health and children's institutions.

The complex and crucial problems presently being solved by the sector's workers are associated with bringing to life the plans of the 11th Five-Year Period. In two years and nine months the production output has increased by 10.2



percent, which exceeds the pace envisioned by the five-year plan. One of the main tasks of the five-year period is being sequentially resolved. This is the stable development of industry on the basis of intensification of production, economy of all types of resources and improvement of production quality.

In two years and nine months, over 48,000 tons of cement, 9,000 tons of metal, 30,000 cubic meters of lumber materials, 24,000 tons of conditional fuel, 300,000 gigacalories of thermal energy, and 70 million kilowatt-hours of electrical power have been saved.

A firm course has been taken from the start of the five-year period for fully ensuring the growth of production due to increased labor productivity. In this period it has increased by 13.7 percent, which has made it possible to fulfill the five-year assignment of its growth rate in 2.5 years.

A system of engineering acquisitions is being perfected in the main administration and methods of setting up house building combines within Glavmosstroy for the purpose of their application in our conditions are being studied. Measures are being realized on improving the quality of production, particularly reinforced concrete, carpentry and hardware products.

The material interest of the workers and engineering-technical personnel in the output of high quality products is intensifying and requirements for executives and managers of all ranks are increasing.

Glavk is taking immediate measures to increase production and improve the quality of non-metalliferous materials and clay brick. The reconstruction and expansion of five major facilities in the non-metalliferous industry are being performed to replenish exhausted deposits and depleting capacities. Twenty-nine million rubles in capital investments are directed toward this end. Next year a new shop with capacity of 75 million pieces of brick per year will be introduced at the Gol'tsinskiy Ceramic Plant. The reconstruction of the Cheremushkinskiy, Ochakovskiy, Nikol'skiy, and Kotel'skiy Brick Plants is being performed. In the next five-year period, the construction of a plant with capacity of 150 million pieces of brick per year is being planned, with subsequent development up to 300 million units per year.

Much attention is being given to the production of keramzit gravel--one of the basic materials for making outside wall panels. The introduction of new, improved technological processes has recently made it possible to increase its output and to fully provide for the needs of construction. The raw material base for its production will be strengthened in the next few years. Measures have been worked out for the development of other sectors and productions which ensure the leading development of the building materials industry as compared with the rate of construction-installation work being done in Moscow.

The workers of glavk enterprises see their task as significantly accelerating the technical re-tooling and development of production in the second half of the 11th Five-Year Period based on its intensification, and to strengthen the responsibility and discipline of workers and increase the quality of the manufactured product.

## BUILDING MATERIALS

### RECYCLED INDUSTRIAL BY-PRODUCTS USED IN CONSTRUCTION

Moscow STROITEL'NAYA GAZETA in Russian 16 Nov 83 p 3

[Article by V. Penkin, chief of the Construction Supply Section, Khabarovsk Main Territorial Administration, USSR Gosplan: "Over the Beaten Path: A Second Life for Secondary Resources"]

[Text] An interesting exhibition which will be on permanent display opened at the Khabarovsk House of Technology. On the display stands are bricks, rolls of roofing felt, stacks of fiberglass, flasks filled with cement, and concrete cubes. All these are samples of materials obtained at the kray's building industry enterprises using secondary raw materials, the by-products from production. Even the great D. I. Mendeleev noted that the primary task of leading technology is to seek methods of producing the useful from the useless. Practice has shown that the application of secondary resources as raw materials for the manufacture of new products is on the average two times cheaper than utilizing primary materials, and in some cases it is also 15-20 times more effective.

For example, the inclusion of dumped ash from the city TETs-1 [Heat and Power Station] into the charge when firing brick at the Khabarovsk Plant No 3 makes it possible to save 10,000 tons of coal annually. The use of this additive has sharply reduced the defects which previously plagued builders and improved the quality of production. An industry which before was chronically in debt to the state has become profitable. The overall effect from the introduction of new technology has comprised about half a million rubles. Meanwhile, the expenditures for preparing production for the use of ash were only 17,000 rubles. They paid for themselves in the first two years of operation under the new method.

The exhibit acquaints [the viewer] with positive experience and promulgates it. Even more acutely, however, it exposes the unutilized reserves and tells of the problems which are awaiting solution.

It seems that there is no particular need to agitate in favor of using ash in brick production. The technology for it has been worked out and the effectiveness has been proven. However, for ten years since the time of the first successful tests conducted at the building materials and plastic products plant, this enterprise and another brick plant remain the only ones in the kray to utilize these totally free ash additives. A dozen other related

enterprises prefers to work in the old manner.

The Central Construction Laboratory of Glavdal'sstroy [Heavy Industry Construction in the Far East Main Administration] has performed experiments on using ash additives in making concrete. In this case also the results have been impressive: for each cubic meter of production it is possible to save 60-90 kilograms of rubble and 20-50 kilograms of sand. Both the concrete and the wall panels made from it turn out to be of better quality and take on better heat insulation properties. Thirty to thirty-five kilograms of cement may be saved on each cubic meter of bricklaying mortar by adding the "wonder-working" ash to it.

However, these undoubted advantages seem to go unnoticed at Glavdal'sstroy and the "Khabarovskstroyaterialy" association. Almost a million tons of ash goes to residue annually in the kray's heat and power plants, and of this truly rich resource builders take only a small portion for themselves—only seven percent. There is no hope that the situation will change for the better in the future. Not one construction industry enterprise is installing batchers for the application of ash or setting up collectors and quarries at heat and power station dump sites. This most valuable material blows in the wind. Is this good economic management?

Sulfite-yeast mash has proven to be a good concrete plasticizer. Also, SYM additives make it possible to significantly economize on cement. For example, 542 tons of binding agent were saved in one year at the ZhBI-2 Plant due to the addition of mash into the concrete mass. Computations show that the application of sulfite-yeast mash would save 17,000 tons of cement on the whole throughout Glavdal'sstroy.

The advantage is obvious, and there is more than enough mash. After all, it is the by-product of the wood-chemical industry. At one Amur timber-cutting and wood-processing combine, 85,000 tons of it are produced annually. However, for this year the glavk [main administration] has only ordered 120 tons of the plasticizer. For comparison we will say that the Blagoveshchenskiy House-Building Combine alone in the neighboring Amur Oblast has requested 600 tons of mash. In Khabarovsk Kray it is not even used by the ZhBI-6 Plant, which is located practically across the street from the Amur House-Building Combine. It is also no longer being used by the ZhBI [Reinforced Concrete Products] Plant, which has become convinced by its own experience of the advantages of the "free" plasticizer.

What, then, is the matter? Is the technology too labor consumptive? No. It is simply the desire not to burden oneself with additional worries, to look for something, to re-tool production, and to perfect the process. It is much simpler to "beat out" additional funds for basic raw materials than to bother with some kind of by-product.

This standpoint is clearly evident in the example of the Teplozerskiy Cement Plant. Last year the cement producers requested 3,000 tons of mash. They said that this would help increase production output and improve quality. All this is true, but when they received the assets at the plant, they began

reject them. They found out that it was necessary to develop the technology and to experiment. Isn't it simpler to follow the beaten track? In any case, it is calmer.

Such lack of initiative and condescending attitude toward secondary raw materials have also given rise to the following situation. In a kray which has a well-developed lumber and wood-processing industry (and this means also the presence of a large amount of wood by-products), the manufacture of wood splint-slabs has not been perfected at building industry enterprises. The entire amount [of these slabs] required for construction--up to 60,000 square meters a year--is brought here to this taiga kray from the Transbaykal region. Moreover, the Transbaykal producers cannot always meet all the orders, and the Khabarovsk building sites experience a shortage of slabs. And yet the glavk cannot begin on-site production of wood-splint slabs at its wood processing combines.

Of course, it is simpler and more reliable to seek Gosstab [State Committee for Material and Technical Supply] funds. This is an advantage to them, to those who seek a quiet life. Today we are actively speaking of the formulation of economic thinking. This situation is a good cause for thought and analysis.

Unfortunately, the practice of carefree economic management with free rein and at state expense is not contradicted by the existing system of statistical accountability on the economy of material resources. It turns out that it is fully possible to "economize" on paper without burdening oneself by seeking new reserves. Even the No 10-SN accounting form gives room for such creative paperwork. Oriented not toward the ratified expenditure norms, but toward the possibility of substituting materials even at the planning stage, it permits remarkable paradoxes to arise. For example, the Zhelezobeton No 1 Trust last year overexpended 2,909 tons of cement, while according to the report No 10-SN it seems that it "saved" 6,826 tons of it. Remarkable! Is it worth burdening oneself with stricter measures of economy and worry about replacing basic materials with secondary raw materials when it is possible to look good due to semantic equilibristics and to manipulations of accounting graphs?

The accounting form No 14-SN which was introduced this year enjoys much less good favor. It deals with the application of secondary raw materials at enterprises. Many building organizations simply ignore it. Understandably, they have nothing to say on this matter.

The documentation of industrial by-products which is not completed in time, by 1 July as projected, throughout the country and here in the Far East in particular, also hinders the operational introduction of secondary resources. This is a very important task on "inventorizing" the potential raw material for new production, and should be completed sooner. It will help turn many materials which are useless today into useful and very much needed materials at construction sites.

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